

# **TS 200 DES/EL**

# **TS 200 LDES/EL**

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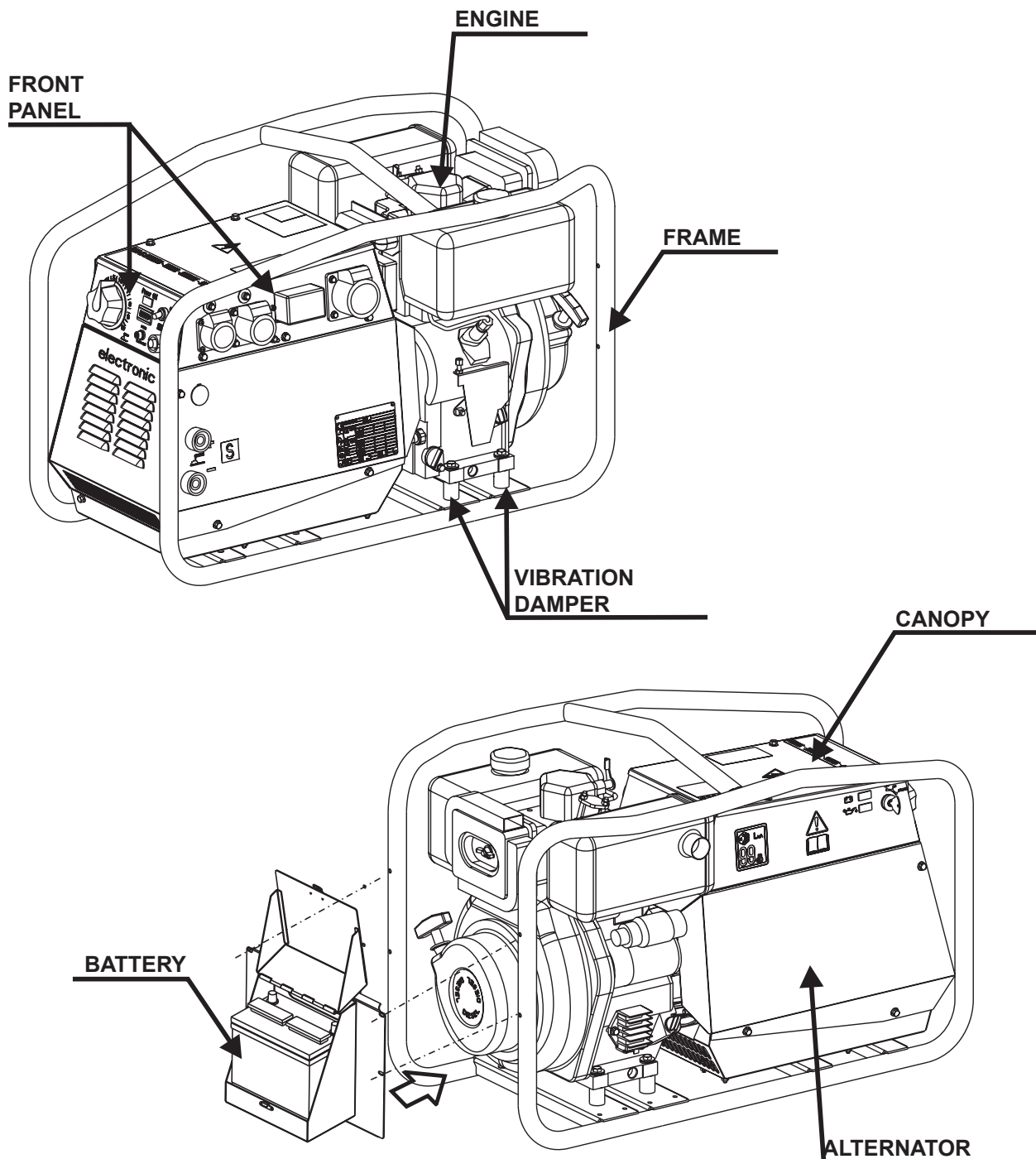
## **USE AND MAINTENANCE MANUAL**

## **SPARE PARTS CATALOG**

The TS 200 engine driven welder is a unit which ensures the function as:

- a) a current source for arc welding
- b) a current source for the auxiliary generation

Unit meant for industrial and professional use, powered by an endothermic engine; it is composed of various main parts such as: engine, alternator, electric and electronic controls, the fairing or a protective structure. The assembling is made on a steel structure, on which are provided elastic support which must damp the vibrations and also eliminate sounds which would produce noise.





**UNI EN ISO 9001 : 2008**

ISO 9001:2008 - Cert. 0192

MOSA has certified its quality system according to UNI EN ISO 9001:2008 to ensure a constant, high quality of its products. This certification covers the design, production and servicing of engine driven welders and generating sets.

The certifying institute, ICIM, which is a member of the International Certification Network IQNet, awarded the official approval to MOSA after an examination of its operations at the head office and plant in Cusago (MI), Italy.

This certification is not a point of arrival but a pledge on the part of the entire company to maintain a level of quality of both its products and services which will continue to satisfy the needs of its clients, as well as to improve the transparency and the communications regarding all the company's activities in accordance with the official procedures and in harmony with the MOSA Manual of Quality.

The advantages for MOSA clients are:

- Constant quality of products and services at the highest level which the client expects;
- Continuous efforts to improve the products and their performance at competitive conditions;
- Competent support in the solution of problems;
- Information and training in the correct application and use of the products to assure the security of the operator and protect the environment;
- Regular inspections by ICIM to confirm that the requirements of the company's quality system and ISO 9001 are being respected.

All these advantages are guaranteed by the CERTIFICATE OF QUALITY SYSTEM No.0192 issued by ICIM S.p.A. - Milano (Italy) - www.icim.it

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DR ...	SPARE PARTS



## ATTENTION

This use and maintenance manual is an important part of the machines in question.

The assistance and maintenance personnel must keep said manual at disposal, as well as that for the engine and alternator (if the machine is synchronous) and all other documentation about the machine.

We advise you to pay attention to the pages concerning the security (see page M1.1).



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## INFORMATION

Dear Customer,  
We wish to thank you for having bought from MOSA a high quality set.

Our sections for Technical Service and Spare Parts will work at best to help you if it were necessary.

To this purpose we advise you, for all control and overhaul operations, to turn to the nearest authorized Service Centre, where you will obtain a prompt and specialized intervention.

- ☞ In case you do not profit on these Services and some parts are replaced, please ask and be sure that are used exclusively original MOSA parts; this to guarantee that the performances and the initial safety prescribed by the norms in force are re-established.
- ☞ **The use of non original spare parts will cancel immediately any guarantee and Technical Service obligation from MOSA.**

## NOTES ABOUT THE MANUAL

Before actioning the machine please read this manual attentively. Follow the instructions contained in it, in this way you will avoid inconveniences due to negligence, mistakes or incorrect maintenance. The manual is for qualified personnel, who knows the rules: about safety and health, installation and use of sets movable as well as fixed.

You must remember that, in case you have difficulties for use or installation or others, our Technical Service is always at your disposal for explanations or interventions.

The manual for Use Maintenance and Spare Parts is an integrant part of the product. It must be kept with care during all the life of the product.

In case the machine and/or the set should be yielded to another user, this manual must also given to him.

Do not damage it, do not take parts away, do not tear pages and keep it in places protected from dampness and heat.

You must take into account that some figures contained in it want only to identify the described parts and therefore might not correspond to the machine in your possession.

## INFORMATION OF GENERAL TYPE

In the envelope given together with the machine and/or set you will find: the manual for Use Maintenance and Spare Parts, the manual for use of the engine and the tools (if included in the equipment), the guarantee (in the countries where it is prescribed by law).

Our products have been designed for the use of generation for welding, electric and hydraulic system; ANY OTHER DIFFERENT USE NOT INCLUDED IN THE ONE INDICATED, relieves MOSA from the risks which could happen or, anyway, from that which was agreed when selling the machine; MOSA excludes any responsibility for damages to the machine, to the things or to persons in this case.

Our products are made in conformity with the safety norms in force, for which it is advisable to use all these devices or information so that the use does not bring damage to persons or things.

While working it is advisable to keep to the personal safety norms in force in the countries to which the product is destined (clothing, work tools, etc.).

Do not modify for any motive parts of the machine (fastenings, holes, electric or mechanical devices, others..) if not duly authorized in writing by MOSA: the responsibility coming from any potential intervention will fall on the executioner as in fact he becomes maker of the machine.

- ☞ **Notice:** *this manual does not engage MOSA, who keeps the faculty, apart the essential characteristics of the model here described and illustrated, to bring betterments and modifications to parts and accessories, without putting this manual uptodate immediately.*












Any of our product is labelled with CE marking attesting its conformity to applicable directives and also the fulfillment of safety requirements of the product itself; the list of these directives is part of the declaration of conformity included in any machine standard equipment.

Here below the adopted symbol:

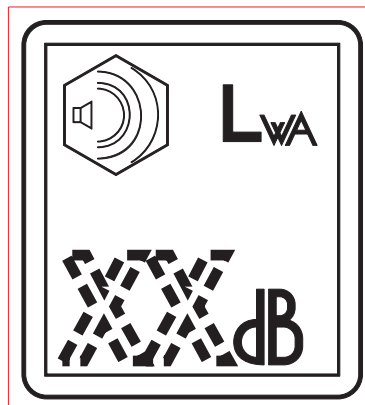


CE marking is clearly readable and unerasable and it can be either part of the data-plate.

<b>MOSA</b>		V.le Europa, 59-20090 CUSAGO (MI) ITALY	
		tel. +39-0290352.1 fax. +39-0290390466	
		http://www.mosa.it e-mail: info@mosa.it	
	Made in UE-ITALY	TYPE	
		SERIAL N°	
		X	
		I <sub>2</sub> (A)	
	U <sub>0</sub>	U <sub>2</sub> (V)	
		I <sub>2</sub> (A)	
		U <sub>2</sub> (V)	
	Hz	kVA	
	P.F.	V (V)	
		I (A)	
	n	RPM	n <sub>1</sub>
	n <sub>0</sub>	RPM	P <sub>max</sub>
		KW	I. CL.
			IP

<b>MOSA</b>		V.le Europa, 59-20090 CUSAGO (MI) ITALY	
		tel. +39-0290352.1 fax. +39-0290390466	
		http://www.mosa.it e-mail: info@mosa.it	
	Made in UE-ITALY	TYPE	
		Generating Set ISO 8528	SERIAL N°
<b>KVA</b>			
<b>V</b>			
<b>I</b>			
Hz		P.F.	LTP POWER IN ACCORDANCE WITH ISO 8528
RPM		I. CL.	IP
ALTIT.	100 m	TEMP.	25 °C
			MASS

Furthermore, on each model it is shown the noise level value; the symbol used is the following:



The indication is shown in a clear, readable and indeleble way on a sticker.

**BCS S.p.A.**Sede legale:  
Via Marradi 1  
20123 Milano - Italia**Stabilimento di Cusago, 20090 (MI) - Italia**V.le Europa 59  
Tel.: +39 02 903521  
Fax: +39 02 90390466

ISO 9001:2000 - Cert. 0192

**DICHIARAZIONE DI CONFORMITA'**Déclaration de Conformité – Declaration of Conformity – Konformitätserklärung  
Conformiteitsverklaring – Declaración de Conformidad

BCS S.p.A. dichiara sotto la propria responsabilità che la macchina:  
BCS S.p.A. déclare, sous sa propre responsabilité, que la machine:  
BCS S.p.A. declares, under its own responsibility, that the machine:  
BCS S.p.A. erklärt, daß die Aggregate:  
BCS S.p.A. verklaard, onder haar eigen verantwoordelijkheid, dat de machine:  
BCS S.p.A. declara bajo su responsabilidad que la máquina:

GRUPPO ELETTOGENO DI SALDATURA / WELDING GENERATOR GRUPPO ELETTOGENO / POWER GENERATOR 

Marchio / Brand : MOSA

Modello / Model :

Matricola / Serial number :

è conforme con quanto previsto dalle Direttive Comunitarie e relative modifiche:  
est en conformité avec ce qui est prévu par les Directives Communautaires et relatives modifications:  
conforms with the Community Directives and related modifications:  
mit den Vorschriften der Gemeinschaft und deren Ergänzungen übereinstimmt:  
in overeenkomst is met de inhoud van gemeenschapsrichtlijnen gerelateerde modificaties:  
comple con los requisitos de la Directiva Comunitaria y sus anexos:

**2006/42/CE - 2006/95/CE - 2004/108/CE**

Nome e indirizzo della persona autorizzata a costituire il fascicolo tecnico :

Nom et adresse de la personne autorisée à composer le Dossier Technique :

Person authorized to compile the technical file and address :

Name und Adresse der zur Ausfüllung der technischen Akten ermächtigten Person :

Persoon bevoegd om het technische document, en bedrijf gegevens in te vullen

Nombre y dirección de la persona autorizada a componer el expediente técnico :

**ing. Benso Marelli - Amministratore Delegato / CEO; V.le Europa 59, 20090 Cusago (MI) - Italy**

Cusago,

  
Ing. Benso Marelli  
Amministratore Delegato  
CEO



**Technical data**

**TS 200 DES/EL**

**D.C. WELDING C.C.**

Duty cycle	170A/60% - 130A/100%
Welding current regulation (I scale)	20 - 170A
Welding voltage	65V

**GENERATOR**

Three-phase generation	6 kVA / 400 V / 8.7 A
Single-phase generation	5 kVA / 230 V / 21.7 A
Single-phase generation	2.5 kVA / 110 V / 22.7 A
Single-phase generation	2 kVA / 48 V / 41.6 A
Frequency	50 Hz
Cos φ	0.8

**ALTERNATOR**

Self-excited, self-regulated

Type	three-phase, asynchronous
Insulating class	H

**ENGINE**

Mark / Model	Yanmar / L 100 N
Type / Cooling system	Diesel 4-Stroke / air
Cylinders / Displacement	1 / 435 cm <sup>3</sup>
Output	6.5 kW (8.8 HP)
Speed	3000 rpm
Fuel consumption (Welding 60%)	1 l/h
Engine oil capacity	1.6 l
Starter	electric

**GENERAL SPECIFICATIONS**

Tank capacity	5.5 l
Running time (Welding 60%)	5.5 h
Protection	IP 23
*Dimensions Lxwxh (mm)	900x550x620
*Weight	133 Kg
Acoustic power LwA (pression LpA)	99 dB(A) (74 dB(A) @ 7 m)

\* Dimensions and weight are inclusive of all parts without wheels and towbar CTM.

**POWER**

Declared power according to ISO 3046-1 (temperature 25°C, 30% relative humidity, altitude 100 m above sea level). It's admitted overload of 10% each hour every 12 h.

In an **approximative** way one reduces: of 1% every 100 m altitude and of 2.5% for every 5°C above 25°C.

**ACOUSTIC POWER LEVEL**

**ATTENTION:** The concrete risk due to the machine depends on the conditions in which it is used. Therefore, it is up to the end-user and under his direct responsibility to make a correct evaluation of the same risk and to adopt specific precautions (for instance, adopting a I.P.D. -Individual Protection Device)

**Acoustic Noise Level (LWA) - Measure Unit dB(A):** it stands for acoustic noise released in a certain delay of time. This is not submitted to the distance of measurement.

**Acoustic Pressure (Lp) - Measure Unit dB(A):** it measures the pressure originated by sound waves emission. Its value changes in proportion to the distance of measurement.


The here below table shows examples of acoustic pressure (Lp) at different distances from a machine with Acoustic Noise Level (LWA) of 95 dB(A)

Lp a 1 meter = 95 dB(A) - 8 dB(A) = 87 dB(A)

Lp a 7 meters = 95 dB(A) - 25 dB(A) = 70 dB(A)

Lp a 4 meters = 95 dB(A) - 20 dB(A) = 75 dB(A)

Lp a 10 meters = 95 dB(A) - 28 dB(A) = 67 dB(A)

**PLEASE NOTE:** the symbol  when with acoustic noise values, indicates that the device respects noise emission limits according to 2000/14/CE directive.

**Technical data**

**TS 200 LDES/EL**

**D.C. WELDING C.C.**

Duty cycle	170A/60% - 130A/100%
Welding current regulation (I scale)	20 - 170A
Welding voltage	65V

**GENERATOR**

Three-phase generation	6 kVA / 400 V / 8.7 A
Single-phase generation	5 kVA / 230 V / 21.7 A
Single-phase generation	2.5 kVA / 110 V / 22.7 A
Single-phase generation	2 kVA / 48 V / 41.6 A
Frequency	50 Hz
Cos φ	0.8

**ALTERNATOR**

Self-excited, self-regulated

Type	three-phase, asynchronous
Insulating class	H

**ENGINE**

Mark / Model	Lombardini 15LD440
Type / Cooling system	Diesel 4-Stroke / air
Cylinders / Displacement	1 / 442 cm <sup>3</sup>
Output	6.8 kW (9.2 HP)
Speed	3000 rpm
Fuel consumption (Welding 60%)	1 l/h
Engine oil capacity	1.5 l
Starter	electric

**GENERAL SPECIFICATIONS**

Tank capacity	5 l
Running time (Welding 60%)	4.5 h
Protection	IP 23
*Dimensions Lxwxh (mm)	900x550x620
*Weight	130 Kg
Acoustic power LwA (pression LpA)	102 dB(A) (77 dB(A) @ 7 m)

\* Dimensions and weight are inclusive of all parts without wheels and towbar CTM.

**POWER**

Declared power according to ISO 3046-1 (temperature 25°C, 30% relative humidity, altitude 100 m above sea level). It's admitted overload of 10% each hour every 12 h.

In an **approximative** way one reduces: of 1% every 100 m altitude and of 2.5% for every 5°C above 25°C.

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Lp a 10 meters = 95 dB(A) - 28 dB(A) = 67 dB(A)

**PLEASE NOTE:** the symbol  when with acoustic noise values, indicates that the device respects noise emission limits according to 2000/14/CE directive.

**Technical data**

**D.C. WELDING**

**Welding current regulation**

20 - 170 A

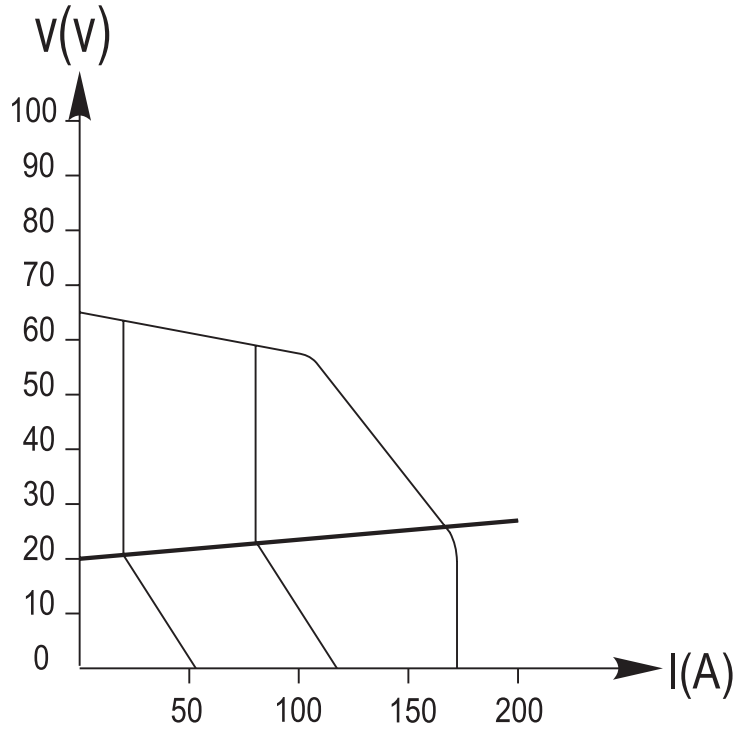
**Service**

170 A - 60%, 130 A - 100%

**Welding voltage**

65 V

**OUTPUT CHARACTERISTIC**



**SIMULTANEOUS UTILIZATION FACTORS**

In case **Welding** and **Generation** can be used simultaneously, however, the engine **cannot** be overloaded. The table below gives the maximum limits to be respected:

<b>WELDING CURRENT</b>	<b>&gt; 100 A</b>	<b>80 A</b>	<b>50 A</b>	<b>0</b>
<b>THREE-PHASE WELDING CURRENT</b>	<b>0</b>	<b>1 kVA</b>	<b>2.5 kVA</b>	<b>6 kVA</b>
<b>SINGLE-PHASE WELDING CURRENT</b>	<b>0</b>	<b>0.8 kVA</b>	<b>2 kVA</b>	<b>5 kVA</b>

## SYMBOLS IN THIS MANUAL

- The symbols used in this manual are designed to call your attention to important aspects of the operation of the machine as well as potential hazards and dangers for persons and things.

## IMPORTANT ADVICE

- Advice to the User about the safety:

☞ N.B.: The information contained in the manual can be changed without notice. Potential damages caused in relation to the use of these instructions will not be considered because these are only indicative. Remember that the non observance of the indications reported by us might cause damage to persons or things. It is understood, that local dispositions and/or laws must be respected.

### WARNING



Situations of danger - no harm to persons or things

#### ***Do not use without protective devices provided***

Removing or disabling protective devices on the machine is prohibited.

#### ***Do not use the machine if it is not in good technical condition***

The machine must be in good working order before being used. Defects, especially those which regard the safety of the machine, must be repaired before using the machine.

## SAFETY PRECAUTIONS



**DANGEROUS**

This heading warns of an immediate danger for persons as well for things. Not following the advice can result in serious injury or death.



**WARNING**

This heading warns of situations which could result in injury for persons or damage to things.



**CAUTION**

To this advice can appear a danger for persons as well as for things, for which can appear situations bringing material damage to things.



**IMPORTANT**



**NOTE**



**ATTENTION**

These headings refer to information which will assist you in the correct use of the machine and/or accessories.

## SYMBOLS



**STOP** - Read absolutely and be duly attentive



Read and pay due attention



**GENERAL ADVICE** - If the advice is not respected damage can happen to persons or things.



**HIGH VOLTAGE** - Attention High Voltage. There can be parts in voltage, dangerous to touch. The non observance of the advice implies life danger.



**FIRE** - Danger of flame or fire. If the advice is not respected fires can happen.



**HEAT** - Hot surfaces. If the advice is not respected burns or damage to things can be caused.



**EXPLOSION** - Explosive material or danger of explosion. in general. If the advice is not respected there can be explosions.



**WATER** - Danger of shortcircuit. If the advice is not respected fires or damage to persons can be caused.



**SMOKING** - The cigarette can cause fire or explosion. If the advice is not respected fires or explosions can be caused.



**ACIDS** - Danger of corrosion. If the advice is not respected the acids can cause corrosions with damage to persons or things.



**WRENCH** - Use of the tools. If the advice is not respected damage can be caused to things and even to persons.



**PRESSION** - Danger of burns caused by the expulsion of hot liquids under pressure.



**ACCES FORBIDDEN** to non authorizad people.

## PROHIBITIONS No harm for persons

### Use only with safety clothing -



It is compulsory to use the personal protection means given in equipment.

### Use only with safety clothing -



It is compulsory to use the personal protection means given in equipment.

### Use only with safety protections -



It is a must to use protection means suitable for the different welding works.

### Use with only safety material -



It is prohibited to use water to quench fires on the electric machines.

### Use only with non inserted voltage -



It is prohibited to make interventions before having disinserted the voltage.

### No smoking -



It is prohibited to smoke while filling the tank with fuel.

### No welding -



It is forbidden to weld in rooms containing explosive gases.

## ADVICE No harm for persons and things

### Use only with safety tools, adapted to the specific use -

It is advisable to use tools adapted to the various maintenance works.

### Use only with safety protections, specifically suitable



It is advisable to use protections suitable for the different welding works.

### Use only with safety protections -



It is advisable to use protections suitable for the different daily checking works.

### Use only with safety protections -




It is advisable to use all protections while shifting the machine.

### Use only with safety protections -



It is advisable to use protections suitable for the different daily checking works.and/or of maintenance.

 The installation and the general advice concerning the operations, are finalized to the correct use of the machine, in the place where it is used as generator group and/or welder.

<b>ENGINE</b>	Stop engine when fueling	<b>CHECKING BOARD</b>	Do not touch electric devices if you are barefoot or with wet clothes.
	Do not smoke, avoid flames, sparks or electric tools when fueling.		Always keep off leaning surfaces during work operations.
	Unscrew the cap slowly to let out the fuel vapours.		Static electricity can damage the parts on the circuit.
	Slowly unscrew the cooling liquid tap if the liquid must be topped up.		An electric shock can kill
	The vapor and the heated cooling liquid under pressure can burn face, eyes, skin.		
	Do not fill tank completely.		
	Wipe up spilled fuel before starting engine.		
	Shut off fuel of tank when moving machine (where it is assembled).		
	Avoid spilling fuel on hot engine.		
Sparks may cause the explosion of battery vapours			



**FIRST AID.** In case the operator should be sprayed by accident, from corrosive liquids a/o hot toxic gas or whatever event which may cause serious injuries or death, predispose the first aid in accordance with the ruling labour accident standards or of local instructions.

Skin contact	Wash with water and soap
Eyes contact	Irrigate with plenty of water, if the irritation persists contact a specialist
Ingestion	Do not induce vomit as to avoid the intake of vomit into the lungs, send for a doctor
Suction of liquids from lungs	If you suppose that vomit has entered the lungs (as in case of spontaneous vomit) take the subject to the hospital with the utmost urgency
Inhalation	In case of exposure to high concentration of vapours take immediately to a non polluted zone the person involved



**FIRE PREVENTION.** In case the working zone, for whatsoever cause goes on fire with flames liable to cause severe wounds or death, follow the first aid as described by the ruling norms or local ones.

EXTINCTION MEANS	
Appropriated	Carbonate anhydride (or carbon dioxide) powder, foam, nebulized water
Not to be used	Avoid the use of water jets
Other indications	Cover eventual shedding not on fire with foam or sand, use water jets to cool off the surfaces close to the fire
Particular protection	Wear an autorespiratory mask when heavy smoke is present
Useful warnings	Avoid, by appropriate means to have oil sprays over metallic hot surfaces or over electric contacts (switches, plugs, etc.). In case of oil sprinkling from pressure circuits, keep in mind that the inflammability point is very low.

WARNING					CAUTION		DANGER

 <b>WARNING</b>	<b>THE MACHINE <u>MUST NOT BE USED</u> IN AREAS WITH EXPLOSIVE ATMOSPHERE</b>
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## INSTALLATION AND ADVICE BEFORE USE

The operator of the welder is responsible for the security of the people who work with the welder and for those in the vicinity.

The security measures must satisfy the rules and regulations for engine driven welders.

The information given below is in addition to the local security norms.

Estimate possible electromagnetic problems in the work area taking into account the following indications.

1. Telephonic wirings and/or of communication, check wirings and so on, in the immediate vicinity.
2. Radio and television receptors and transmitters.
3. Computer and other checking devices.
4. Critical devices for safety and/or for industrial checks.
5. People who, for instance, use pace-maker, hearing-aid for deaf or something and else.
6. Devices used for rating and measuring.
7. The immunity of other devices in the operation area of the welder. Make sure that other used devices are compatible. If it is the case, provide other additional measures of protection.
8. The daily duration of the welding time.



Make sure that the area is safe before starting any welding operation.

- Do not touch any bare wires, leads or contacts as they may be live and there is danger of electric shock which can cause death or serious burns. The electrode and welding cables, etc. are live when the unit is operating.
- Do not touch any electrical parts or the electrode while standing in water or with wet hands, feet or clothes.
- Insulate yourself from the work surface while welding. Use carpets or other insulating materials to avoid physical contact with the work surface and the floor.
- Always wear dry, insulating gloves, without holes, and body protection.
- Do not wind cables around the body.
- Use ear protections if the noise level is high.
- Keep flammable material away from the welding area.
- Do not weld on containers which contain flammable material.
- Do not weld near refuelling areas.
- Do not weld on easily flammable surfaces.
- Do not use the welder to defrost (thaw) pipes.
- Remove the electrode from the electrode holder, when not welding.
- Avoid inhaling fumes by providing a ventilation system or, if not possible, use an approved air breather.
- Do not work in closed areas where there is no fresh air flow.
- Protect face and eyes (protective mask with suitable dark lens and side screens), ears and body (non-flammable protective clothers).



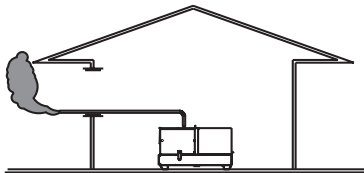
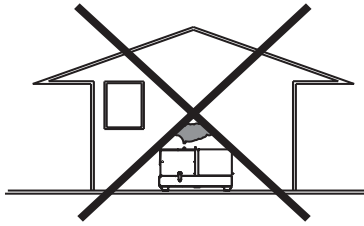
## INSTALLATION AND ADVICE BEFORE USE

### GASOLINE ENGINES

- ☞ Use in open space, air swept or vent exhaust gases, which contain the deadly carbone oxyde, far from the work area.

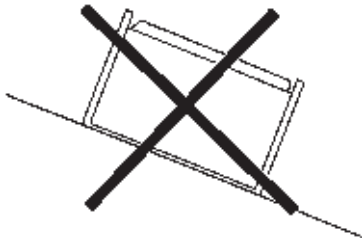
### DIESEL ENGINES

- ☞ Use in open space, air swept or vent exhaust gases far from the work area.

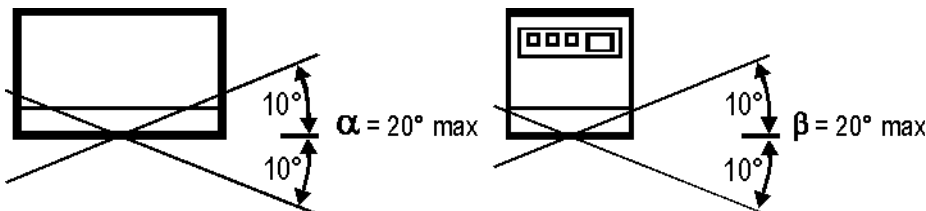


### POSITION

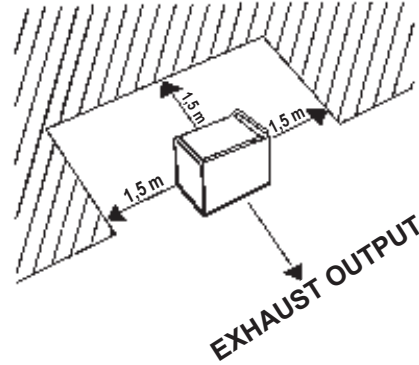
Place the machine on a level surface at a distance of at least 1,5 m from buildings or other plants.



Maximum leaning of the machine (in case of dislevel)



Check that the air gets changed completely and the hot air sent out does not come back inside the set so as to cause a dangerous increase of the temperature.



- ☞ Make sure that the machine does not move during the work: **block** it possibly with tools and/or devices made to this purpose.

### MOVES OF THE MACHINE

- ☞ At any move check that the engine is **off**, that there are no connections with cables which impede the moves.

### PLACE OF THE MACHINE



## ATTENTION

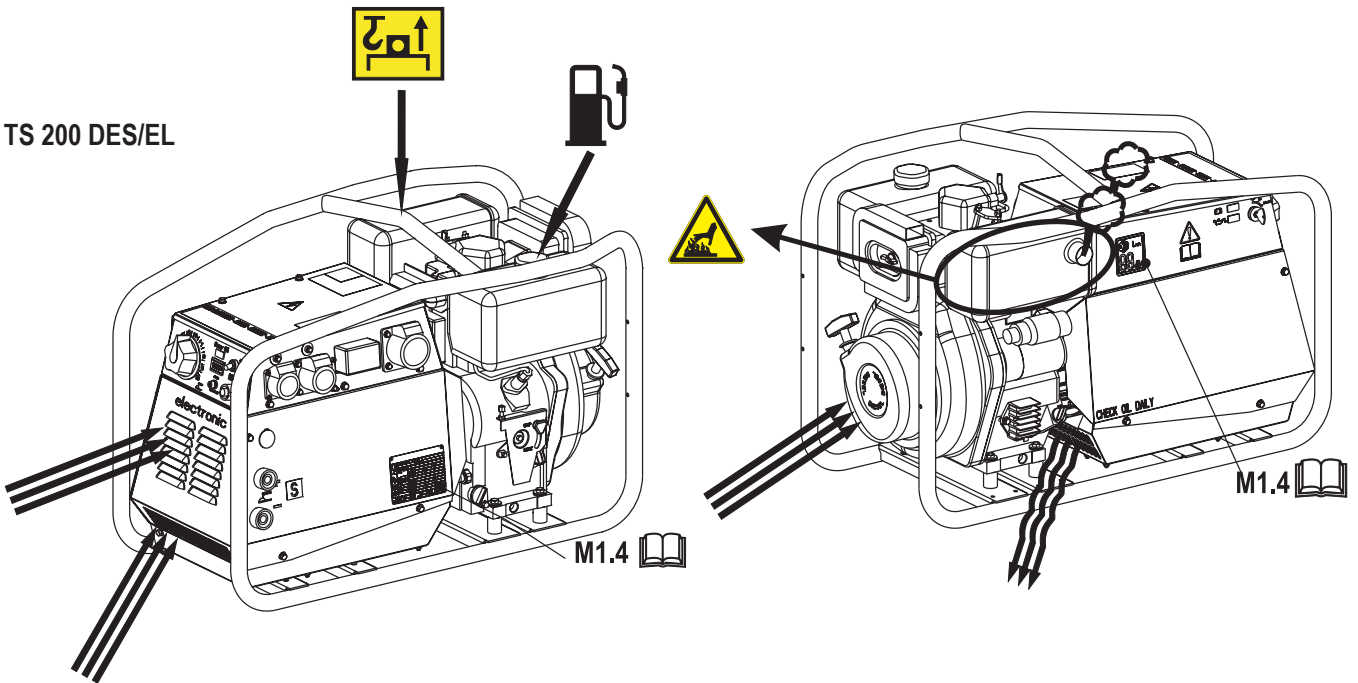


For a safer use from the operator **DO NOT** fit the machine in locations with high risk of flood.

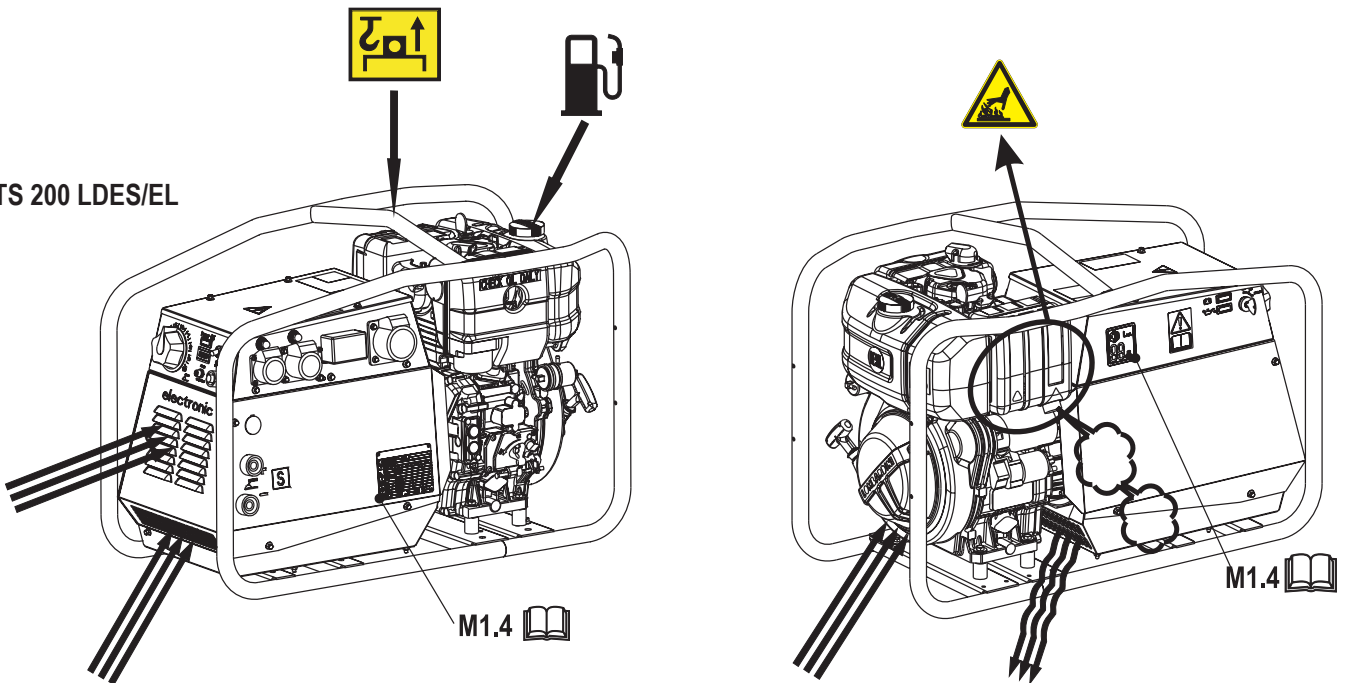
Please do not use the machine in weather conditions which are beyond IP protection shown both in the data plate and on page named "technical data" in this same manual.

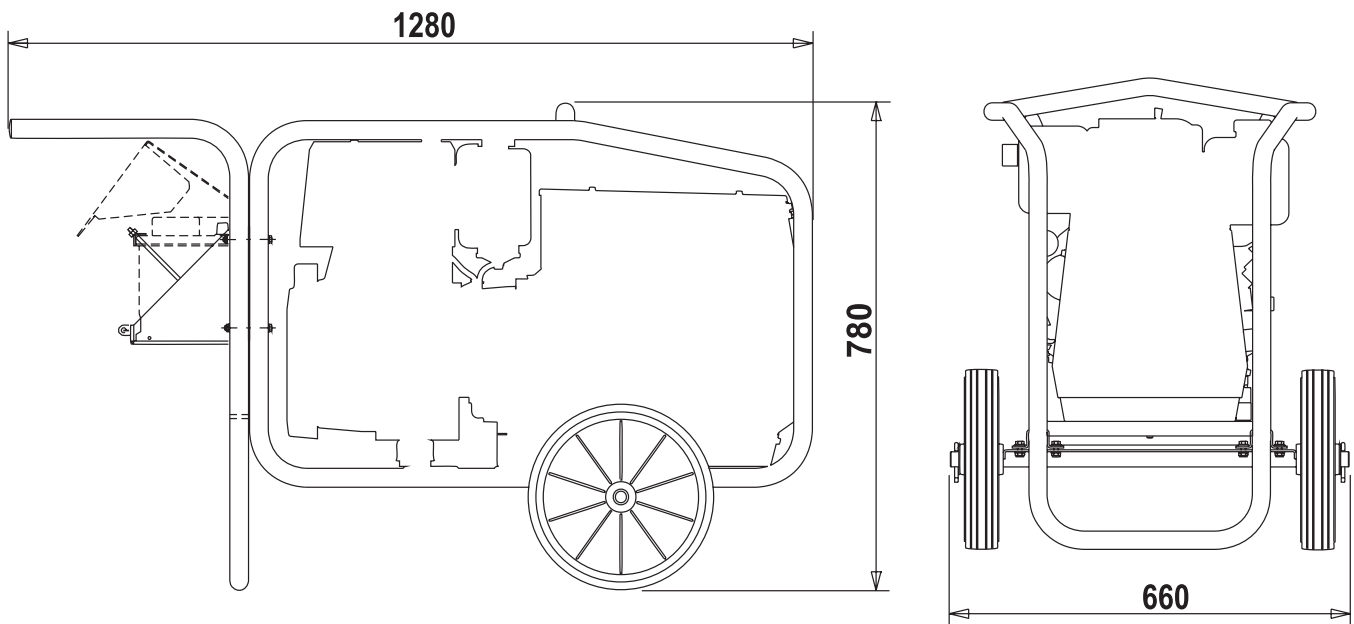
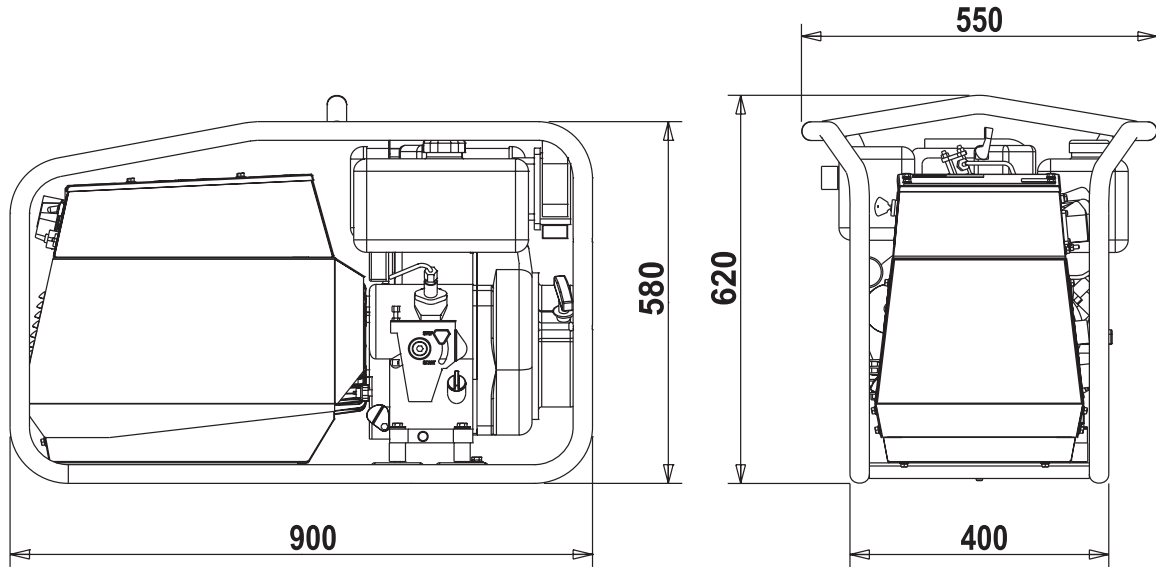


TS 200 DES/EL



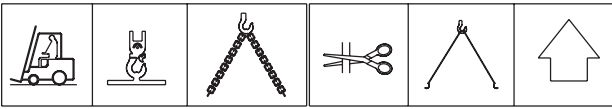
TS 200 LDES/EL





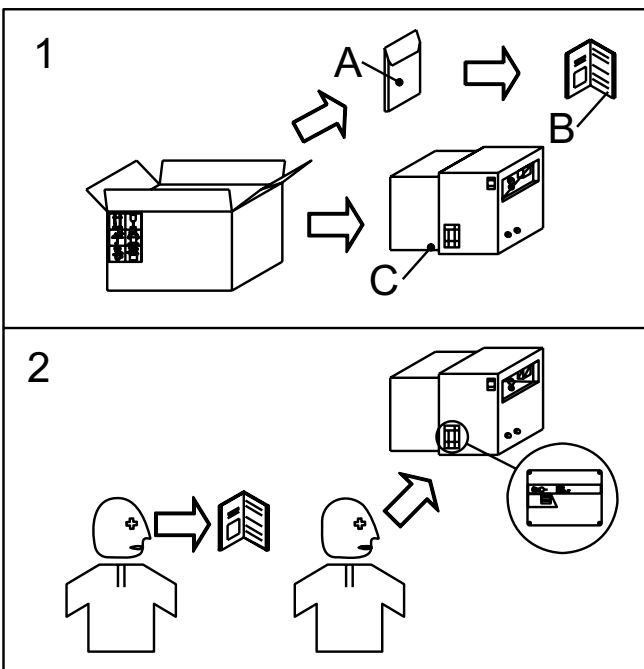
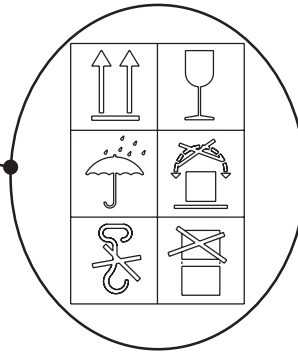
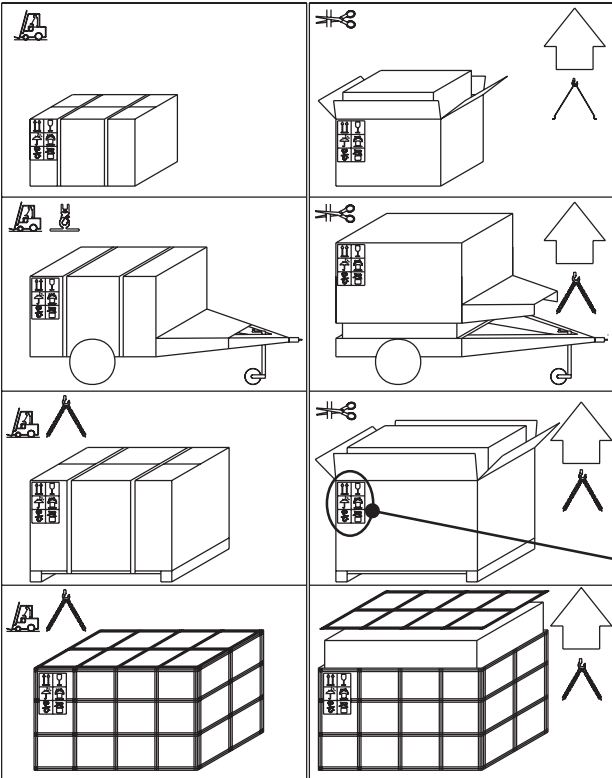


## NOTE



Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with its packaging, and conforms to local rules and regulations. When receiving the goods make sure that the product has not suffered damage during the transport, that there has not been rough handling or taking away of parts contained inside the packing or in the set. In case you find damages, rough handling or absence of parts (envelopes, manuals, etc.), we advise you to inform immediately our Technical Service.

For eliminating the packing materials, the User must keep to the norms in force in his country.



- 1) Take the machine (C) out of the shipment packing. Take out of the envelope (A) the user's manual (B).
- 2) Read: the user's manual (B), the plates fixed on the machine, the data plate.



**NOTE**

Transportation must always take place with the engine off, electrical cables and starting battery disconnected and fuel tank empty.

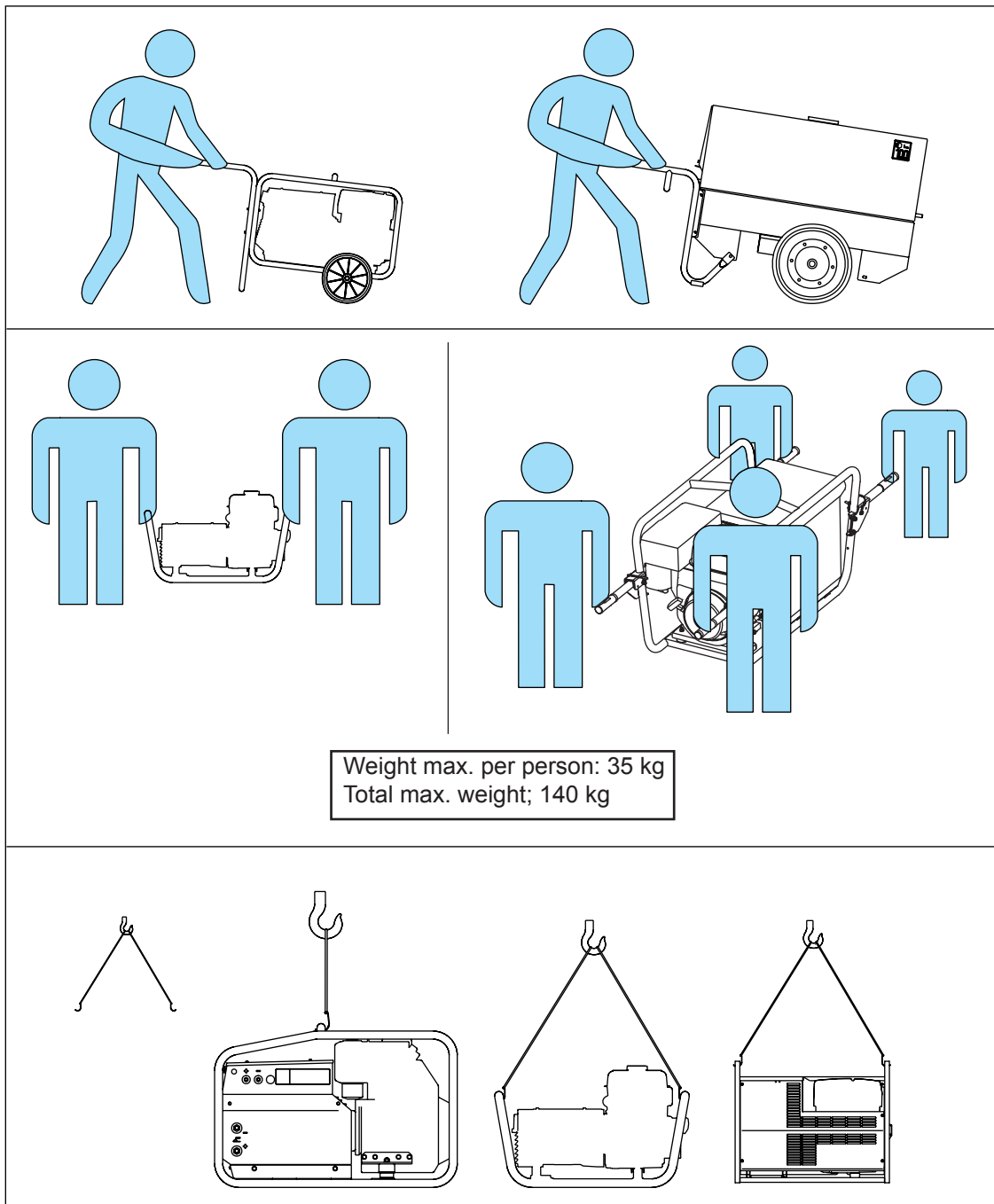
Be sure that the lifting devices are: correctly mounted, adequate for the weight of the machine with its packaging, and conform to local rules and regulations.

Only authorized persons involved in the transport of the machine should be in the area of movement.

**DO NOT LOAD OTHER PARTS WHICH CAN MODIFY WEIGHT AND BARICENTER POSITION.**

**IT IS STRICTLY FORBIDDEN TO DRAG THE MACHINE MANUALLY OR TOW IT BY ANY VEHICLE (model with no CTM accessory).**

If you did not keep to the instructions, you could damage the structure of the machine.



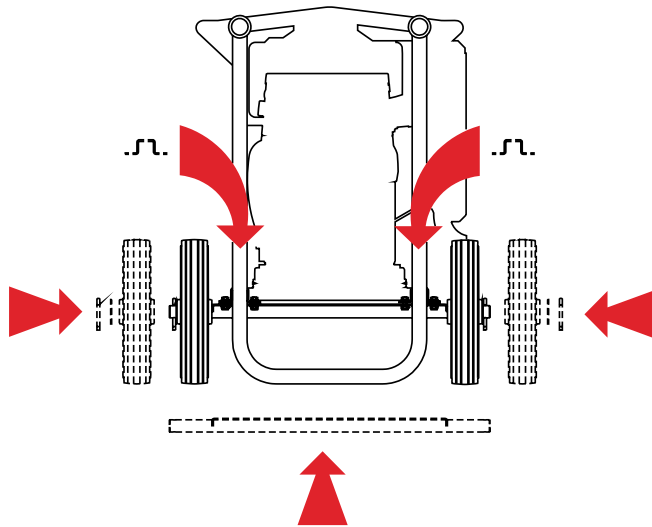
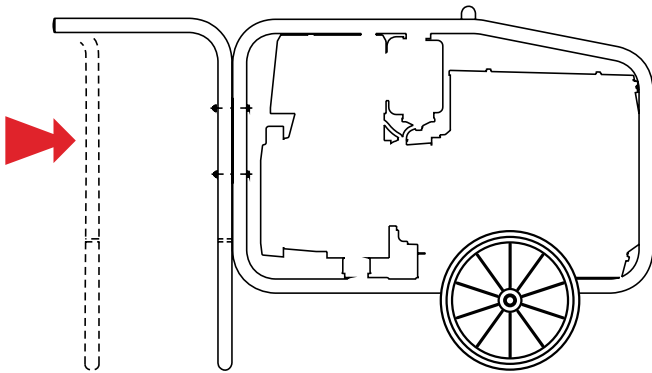
Weight max. per person: 35 kg  
Total max. weight; 140 kg



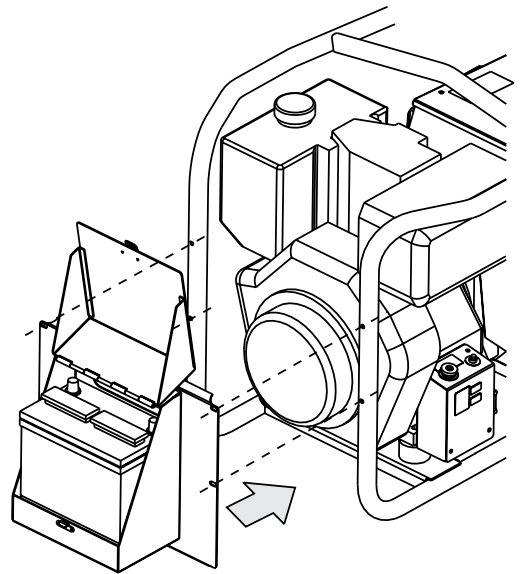
## ATTENTION

The CTM accessory cannot be removed from the machine and used separately (actioned manually or following vehicles) for the transport of loads or anyway for used different from the machine movements.

**Note:** Lift the machine and assemble the parts as shown in the drawing



PB3





## BATTERY WITHOUT MAINTENANCE



Connect the cable + (positive) to the pole + (positive) of the battery (after having taken away the protection), by properly tightening the clamp.

Check the state of the battery from the colour of the warning light which is in the upper part.

- Green colour: battery OK
- Black colour: battery to be recharged
- White colour: battery to be replaced

**DO NOT OPEN THE BATTERY.**



## LUBRICANT

### RECOMMENDED OIL

MOSA recommends selecting **AGIP** engine oil. Refer to the label on the motor for the recommended products.

PRODOTTI RACCOMANDATI RECOMMENDED PRODUCTS	
AGIP SIGMA TURBO PLUS 15W/40 API CG4 - ACEA E3	OLIO MOTORE DIESEL DIESEL ENGINE OIL
AGIP SUPERMOTOROIL 20W/50 API CC-SF	OLIO MOTORE BENZINA GASOLINE ENGINE OIL
AGIP ANTIFREEZE EXTRA INIBITE ETHYLENE GLYCOL (50% + 50% + H <sub>2</sub> O)	CIRCUITO DI RAFFREDDAMENTO COOLING CIRCUIT (CUNA NC 956-16 ED 97)

Please refer to the motor operating manual for the recommended viscosity.

### REFUELLING AND CONTROL:

Carry out refuelling and controls with motor at level position.

1. Remove the oil-fill tap (24)
2. Pour oil and replace the tap
3. Check the oil level using the dipstick (23); the oil level must be comprised between the minimum and maximum indicators.



## ATTENTION

It is dangerous to fill the motor with too much oil, as its combustion can provoke a sudden increase in rotation speed.



## DRY AIR FILTER

Check that the dry air filter is correctly installed and that there are no leaks around the filter which could lead to infiltrations of non-filtered air to the inside of the motor.



## OIL BATH AIR FILTER

Fill the air filter using the same engine oil up to the level indicated on the filter.



## FUEL



## ATTENTION



Do not smoke or use open flames during refuelling operations, in order to avoid explosions or fire hazards.

Fuel fumes are highly toxic; carry out operations outdoors only, or in a well-ventilated environment.



Avoid accidentally spilling fuel. Clean any eventual leaks before starting up motor.

Refill the tank with good quality diesel fuel, such as automobile type diesel fuel, for example.

For further details on the type of diesel fuel to use, see the motor operating manual supplied.

Do not fill the tank completely; leave a space of approx. 10 mm between the fuel level and the wall of the tank to allow for expansion.

In rigid environmental temperature conditions, use special winterized diesel fuels or specific additives in order to avoid the formation of paraffin.



## GROUNDING CONNECTION

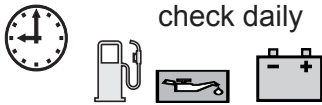
The grounding connection to an earthed installation **is obligatory** for all models equipped with a differential switch (circuit breaker). In these groups the generator star point is generally connected to the machine's earthing; by employing the TN or TT distribution system, the differential switch guarantees protection against indirect contacts.

In the case of powering complex installations requiring or employing additional electrical protection devices, the coordination between the protection devices must be verified.

For the grounding connection, use the terminal (12); comply to local and/or current regulations in force for electrical installations and safety.

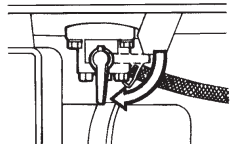


**ELECTRIC STARTING**

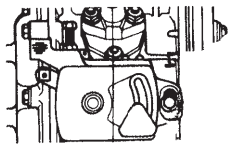


check daily

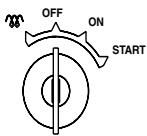
**NOTE**  
Do not alter the primary conditions of regulation and do not touch the sealed parts.



1) Open the fuel cock



2) Accelerator lever must be in the "START" position.



3) Turn the starter key to the "START" position. Once the engine has started let the key return to the "ON" position.

Let the engine run for some minutes before drawing the load.

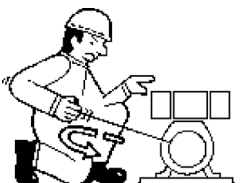
**In case of unsuccessful start-up, do not insist for longer than 5 seconds. Wait 10 seconds before attempting another start-up.**



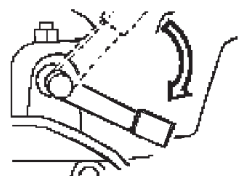
**EMERGENCY STARTING (with starting handle)**



1) hold the starting handle properly



2) pull the starting handle slowly, until you feel resistance...  
3) then return it slowly



4) push the decompression lever down and release...



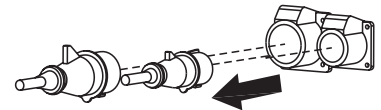
5) pull the rope hard and fast. Pull it all the way out. Use two hands if necessary.

**ATTENTION**  
If battery is not connected, disconnect voltage regulator to prevent damage.

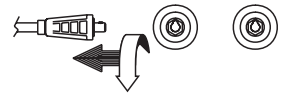
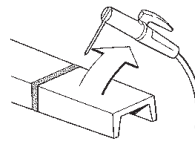
**STOP THE ENGINE**

Before stopping the engine it is **compulsory** to stop the load:

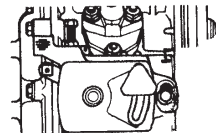
- shut off any loads which are connected to the unit auxiliary outputs;
- disconnect the electric protection device (D);



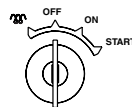
- stop welding.



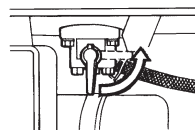
**To stop the engine**



Move the engine speed lever to the "STOP" position



Remove the key (Q1), don't recharge the battery, turning it counter clockwise, OFF position, then take it out.



Shut the fuel cock.

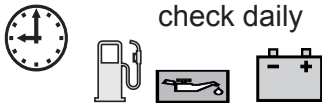
**NB.: for safety reason the key must be kept by qualified personnel.**

**CAUTION**

**RUNNING-IN**  
During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently, in any case please stick to the rules given in the engine use manual.

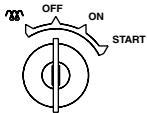


**ELECTRIC STARTING**



check daily

**NOTE**  
Do not alter the primary conditions of regulation and do not touch the sealed parts.



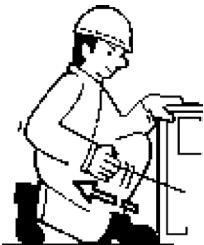
Turn the starter key to the "START" position. Once the engine has started let the key return to the "ON" position.

Let the engine run for some minutes before drawing the load.

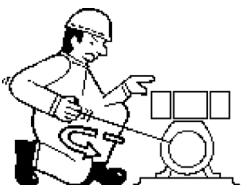
**In case of unsuccessful start-up, do not insist for longer than 5 seconds. Wait 10 seconds before attempting another start-up.**



**EMERGY STARTING (with starting handle)**



1) hold the starting handle properly



2) pull the starting handle slowly, until you feel resistance...  
3) then return it slowly

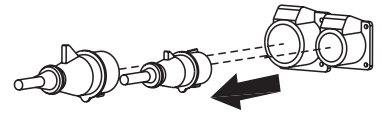


4) pull the rope hard and fast. Pull it all the way out. Use two hands if necessary.

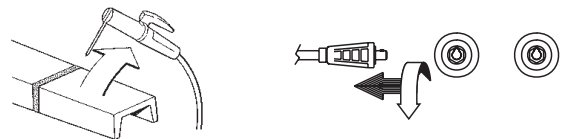
**ATTENTION**  
If battery is not connected, disconnect voltage regulator to prevent damage.

**STOP THE ENGINE**

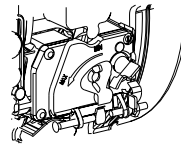
Before stopping the engine it is **compulsory** to stop the load:  
- shut off any loads which are connected to the unit auxiliary outputs;  
- disconnect the electric protection device (D);



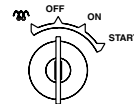
- stop welding.



**To stop the engine**



Move the "STOP" lever to the "STOP" position



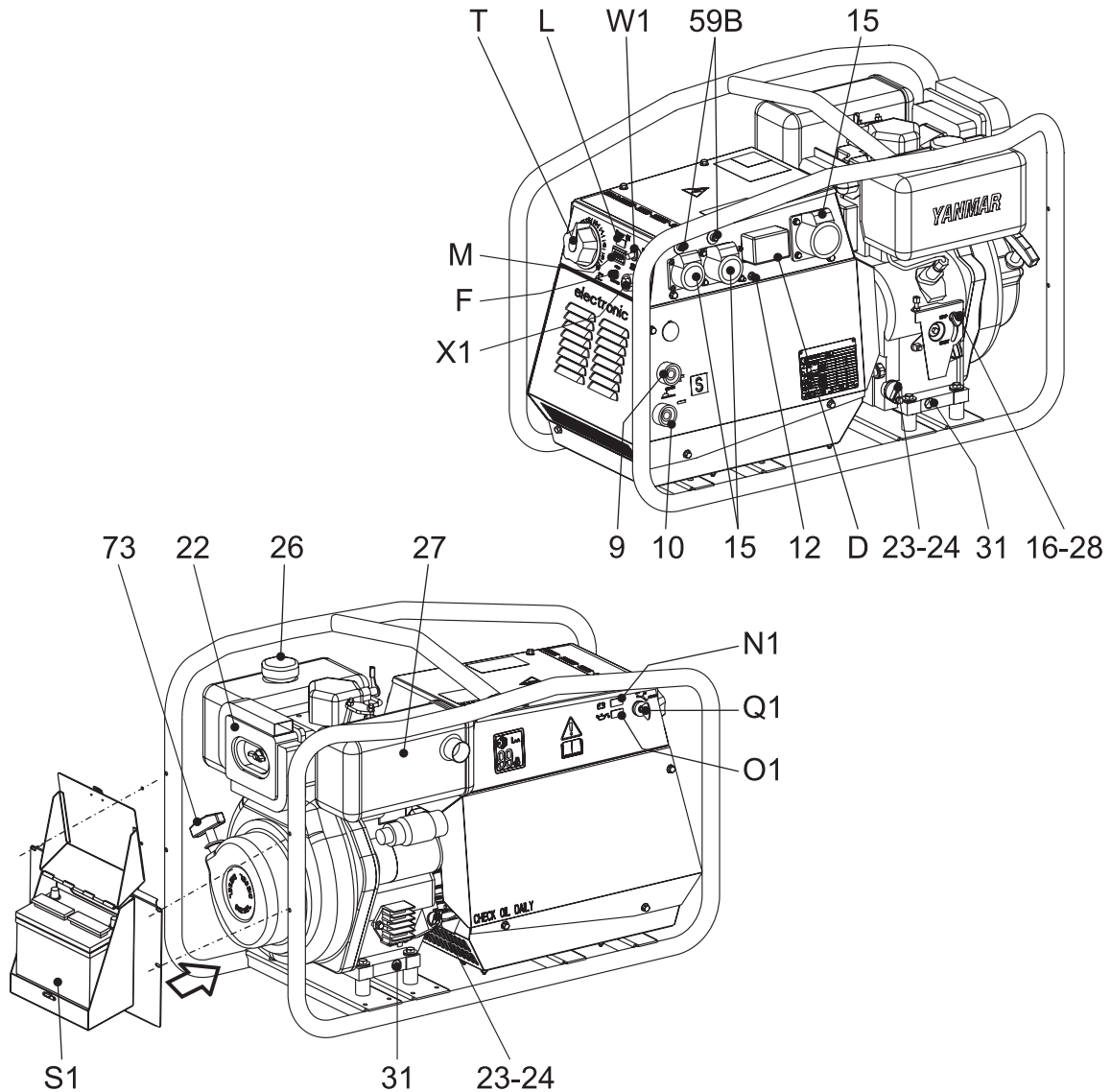
Remove the key (Q1), don't ancharge the battery, turning it counter clockwise, OFF position, then take it out.

**NB.:** for safety reason the key must be kept by qualified personel.

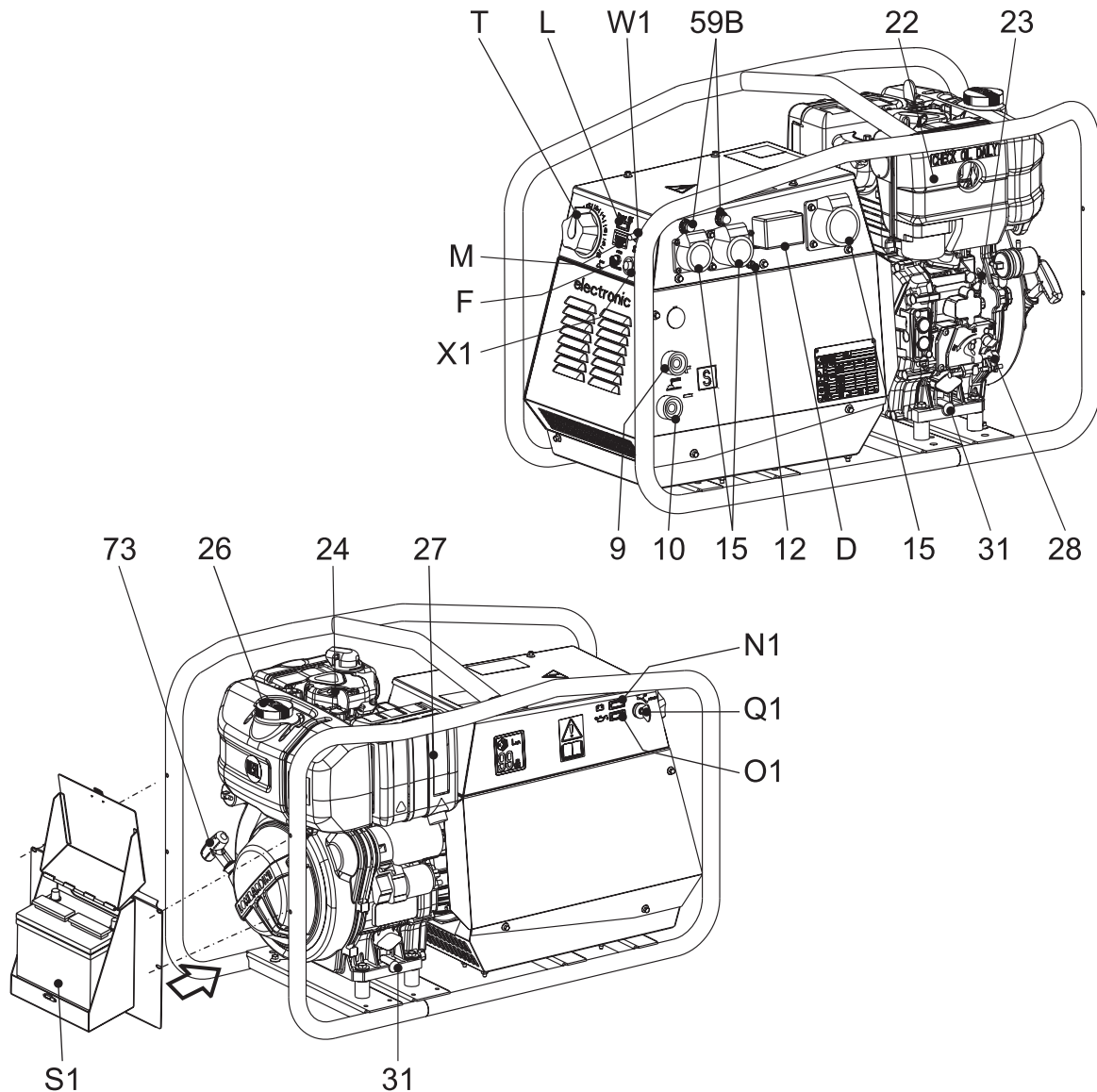
**CAUTION**  
**RUNNING-IN**  
During the first 50 hours of operation, do not use more than 60% of the maximum output power of the unit and check the oil level frequently, in any case please stick to the rules given in the engine use manual.







Pos.	Descrizione	Description	Description	Descripción
9	Presa di saldatura (+)	Welding socket (+)	Prise de soudage (+)	Toma de soldadura (+)
10	Presa di saldatura (-)	Welding socket (-)	Prise de soudage (-)	Toma de soldadura (-)
12	Presa di messa a terra	Earth terminal	Prise de mise à terre	Toma de puesta a tierra
15	Presa di corrente in c.a.	A.C. socket	Prises de courant en c.a.	Toma de corriente en c.a
16	Comando acceleratore	Accelerator / stop lever	Commande accélérateur / stop	Mando de aceleración / stop
22	Filtro aria motore	Engine air filter	Filtre air moteur	Filtro aire motor
23	Asta livello olio motore	Oil level dipstick	Jauge niveau huile moteur	Aguja nivel aceite motor
24	Tappo caricamento olio motore	Engine oil reservoir cap	Bouchon remplissage huile moteur	Tapón llenado aceite motor
26	Tappo serbatoio	Fuel tank cap	Bouchon réservoir	Tapón depósito
27	Silenziatore di scarico	Muffler	Silencieux d'échappement	Silenciador de descarga
28	Comando stop	Stop control	Commande stop	Mando stop
31	Tappo scarico olio motore	Oil drain tap	Bouchon décharge huile moteur	Tapón vaciado aceite motor
59B	Protezione termica corrente aux	Aux current thermal switch	Protection thermique courant aux.	Protección térmica corr. aux
73	Comando manuale avviamento	Starting push button	Commande manuelle démarrage	Mando manual arranque
D	Interruttore differenziale (30mA)	G.F.I.	Interrupteur différentiel	Interruptor diferencial (30 mA)
F	Fusibile	Fuse	Fusible	Fusible
L	Spia luminosa corrente alternata	A.C. output indicator	Voyants tension alternative	Indicadores luminosos c. alter.
M	Contaore	Hour-counter	Compte-heures	Cuentahoras
T	Regolatore corrente di saldatura	Welding current regulator	Régulateur courant soudage	Regulador corr. de soldadura
N1	Spia carica batteria	Battery charge warning light	Voyant charge batterie	Piloto carga batería
O1	Spia lumin. press. olio/oil alert	Oil press.warning light/oil alert	Voyant lumin. press.huile / oil alert	Indic.lum.pres. aceite/oil alert
Q1	Chiave di avviamento	Starter key	Clé de démarrage	Llave de arranque
S1	Batteria	Battery	Batterie	Batería
W1	Interruttore comando a distanza	Remote control switch	Commutateur télécommande	Interruptor mando a distancia
X1	Presa per comando a distanza	Remote control socket	Prise pour télécommande	Toma para mando a distancia



Pos.	Descrizione	Description	Description	Descripción
9	Presa di saldatura (+)	Welding socket (+)	Prise de soudage (+)	Toma de soldadura (+)
10	Presa di saldatura (-)	Welding socket (-)	Prise de soudage (-)	Toma de soldadura (-)
12	Presa di messa a terra	Earth terminal	Prise de mise à terre	Toma de puesta a tierra
15	Presa di corrente in c.a.	A.C. socket	Prises de courant en c.a.	Toma de corriente en c.a.
22	Filtro aria motore	Engine air filter	Filtre air moteur	Filtro aire motor
23	Asta livello olio motore	Oil level dipstick	Jauge niveau huile moteur	Aguja nivel aceite motor
24	Tappo caricamento olio motore	Engine oil reservoir cap	Bouchon remplissage huile moteur	Tapón llenado aceite motor
26	Tappo serbatoio	Fuel tank cap	Bouchon réservoir	Tapón depósito
27	Silenziatore di scarico	Muffler	Silencieux d'échappement	Silenciador de descarga
28	Comando stop	Stop control	Commande stop	Mando stop
31	Tappo scarico olio motore	Oil drain tap	Bouchon décharge huile moteur	Tapón vaciado aceite motor
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73	Comando manuale avviamento	Starting push button	Commande manuelle démarrage	Mando manual arranque
D	Interruttore differenziale (30mA)	G.F.I.	Interrupteur différentiel	Interruptor diferencial (30 mA)
F	Fusibile	Fuse	Fusible	Fusible
L	Spia luminosa corrente alternata	A.C. output indicator	Voyants tension alternative	Indicadores luminosos c. alter.
M	Contaore	Hour-counter	Compte-heures	Cuentahoras
T	Regolatore corrente di saldatura	Welding current regulator	Régulateur courant soudage	Regulador corr. de soldadura
N1	Spia carica batteria	Battery charge warning light	Voyant charge batterie	Piloto carga batería
O1	Spia lumin. press. olio/oil alert	Oil press.warning light/oil alert	Voyant lumin. press.huile / oil alert	Indic.lum.pres. aceite/oil alert
Q1	Chiave di avviamento	Starter key	Clé de démarrage	Llave de arranque
S1	Batteria	Battery	Batterie	Batería
W1	Interruttore comando a distanza	Remote control switch	Commutateur télécommande	Interruptor mando a distancia
X1	Presa per comando a distanza	Remote control socket	Prise pour télécommande	Toma para mando a distancia

**S** This symbol (Norm EN 60974-1 security standards for arc welders) signifies that the welder can be used in areas with increased risk of electrical shock.

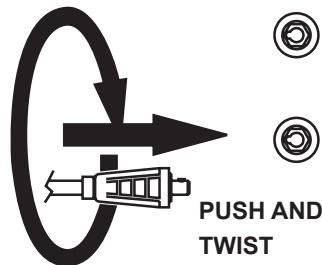


## WARNING

Areas for which access by non-authorized personnel is **forbidden** are:  
- the control panel (at the front) - the endothermic motor discharge - the welding process.

### CONNECT WELDING CABLES

Insert the welding cable plugs completely in the sockets, turning clockwise to lock them in place.



Connect the earth clamp to the negative pole and the electrode holder to the positive.

☞ Pay attention to the two polarities on the welding circuit, which must not come into electrical contact with each other.

- Carefully tighten the output cables to the bushings; if loose, they can cause problems of overheating and damage the bushings, cables, etc.
- Make certain the grounding pincer is connected as near as possible to the work station.



## CAUTION

With a welding cable length up to 20 m is suggested a section of 35 mm<sup>2</sup>; with longer cables a bigger section is required.

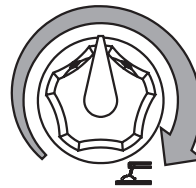
### ADJUSTING THE WELDING CURRENT

For every welding current chosen, the machine shall run at its nominal speed.



## WARNING

Do not modify the regulation of the engine rpm. Speeds different from the rated one can worsen the performances and even the reliability of the machine.



The welding current is regulated by turning knob "T" continuously. If set to the minimum (turned fully in an anticlockwise direction) it provides a current of approximately 30 A; if set to the maximum (turned fully in a clockwise direction) it gives a maximum current of approximately 170A (20V).

### RECOMMENDED ELECTRODES

All the electrodes on the market can be used.



### REMOTE CONTROL TC...

See page M 38

### Protection fuse:



The fuse protects the electronic welding PCB in case the remote control is short circuited.



## ATTENTION

To reduce the risk of electromagnetic interference, keep the welding cable length short and keep them on or near the ground. If possible, welding operations should not be done near sensitive electronic devices. If interference continues to occur, adopt additional measures: shift the group, use shielded cables, line filters, shield the entire work area. If the above solutions do not suffice, consult our Technical Servicing Department.





## DANGEROUS

**It is strictly forbidden to connect the group to the public mains a/o to another source of electric power.**



**Access forbidden to area adjacent to electricity-generating group for all non-authorized personnel.**

The electricity-generating groups are to be considered electrical energy producing stations.

The dangers of electrical energy must be considered together with those related to the presence of chemical substances (fuels, oils, etc.), rotating parts and waste products (fumes, discharge gases, heat, etc.).

### RPM - VOLTAGE - FREQUENCY

The engine speed determines the values of voltage and frequency of the auxiliary generation system.

Check the proper engine operation at its nominal speed before each usage.



## WARNING

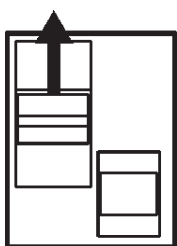
Do not modify the regulation of the engine rpm. Speeds different from the rated one can worsen the performances and even the reliability of the machine.

With no load the values of voltage and frequency are usually superior to their rated values, about 10% for voltage and 5% for frequency. When the power increases with inserted loads, the voltage and frequency values diminish; at full power the voltage can be reduced of 10% and the frequency of 3%.

Before the use check that the electrical specifications for the units to be powered - voltage, power, frequency - are compatible with those of the generator. Values that are too high or too low for voltage and frequency can damage electrical equipment irreparably.

In some cases, for the powering of three-phase loads, it is necessary to ensure that the cyclic direction of the phases corresponds to the installation's requirements.

### GFI



The GFI (D) at high sensitiveness 30 mA, guarantees the protection against indirect contacts caused by faulty currents towards ground.

When the device notes a faulty current at the ground superior to 30 mA, it breaks the feeding at the a.c. sockets.

In case of intervention check that there is no isolation fault in the plant of union cables, sockets and plugs, inserted tools.

Before each work session check the GFI device efficiency pressing the test key. The generating set must be working and the GFI lever in ON position.



## WARNING

The GFI does not work correctly without grounding of the unit. Before use dispose an efficient grounding system using the PE terminal (12) and keeping to rules and laws in force concerning safety and electric plant.

### PLUGS and CABLES

Before inserting a load into the machine check that the cable is in good condition, its section fit for the drawn current and the plug inserted correctly.

### WARNING LIGHT FOR PRESENCE OF VOLTAGE

The warning light (L) "POWER ON" shows, when lit, that the set can give current from the a.c. sockets. In case the warning light not light up, check that the engine runs at its rated value or that the GFI is inserted.

### THERMIC PROTECTION

Generally present to protect against overloads on an individual power socket c.a.

When the nominal operating current has been exceeded, the protection device intervenes by cutting off power to the socket.

The intervention of the protection device against overloads is not instantaneous, but follows a current overload/time outline; the greater the overload the less the intervention.

In case of an intervention, check that the current absorbed by the load does not exceed the protection's nominal operating current.

Allow the protection to cool off for a few minutes before resetting by pressing the central pole.



## ATTENTION

**Do not keep the central pole on the thermic protection forcefully pressed to prevent its intervention.**

### DELIVERED POWER

For each auxiliary voltage it is possible to draw the rated power declared on the data plate. Delivering rated for a definite auxiliary voltage, it is not possible to draw further power from other exits.

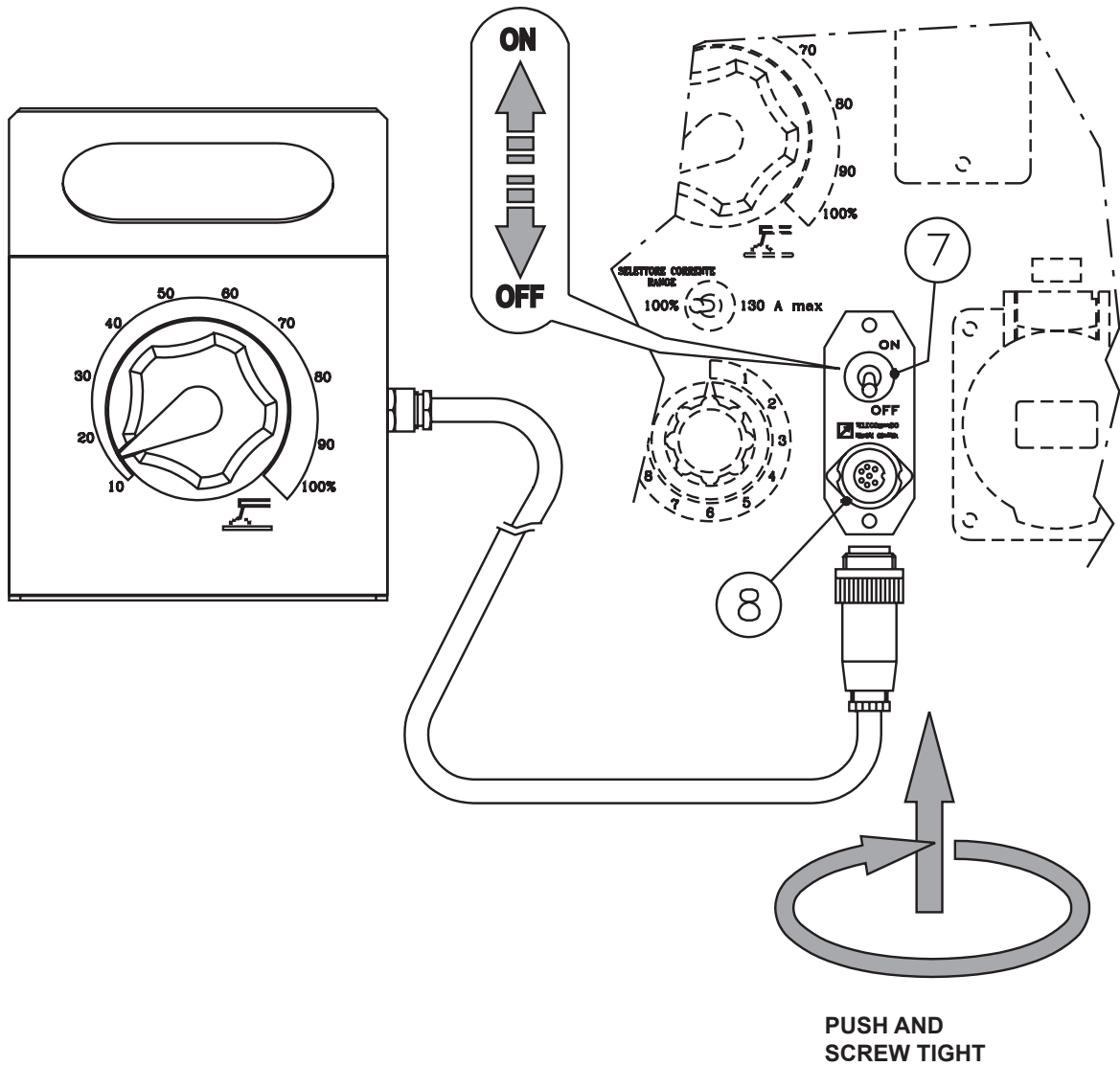
Drawing power from different exits, their sum cannot go over the maximum power declared on data plate, generally the three-phase power.

### SIMULTANEOUS USE

The welder's alternator permits the simultaneous use of auxiliary power and welding current. The auxiliary power available to the AC plugs (15) diminishes as the welding current drawn increases.

The table on page M1.6 TECHNICAL SPECIFICATIONS shows the amount of auxiliary power available as the welding current varies.





The remote control device for regulating the welding current is connected to the front panel by means of a multipole connector.

To regulate the current from the TC2 / TC2/50, move the switch (7), located above the multipole connector (8), to "ON" position.

Position welding current adjusting (T) knob at the necessary current value for the diameter and type of electrode.

The warning lamps brighten by turning the engine starting key (Q1) and they switch off after some seconds.

The engine protection, in case of low oil pressure, is shown by the warning light (O1) without the engine stopping.



The same as for as the battery charger warning (O1) light in concerned, the anomaly is shown without the engine stopping.



If the trouble should persist, please turn to your Assistance Centre.

Once the cause of the problem is removed, to assure the protection it is enough to put the starting key (Q1) to zero ("OFF" position) and start the engine again.

<b>Problems</b>	<b>Possible cause</b>	<b>Solution</b>
<b>WELDING</b>		
<b>P1</b> No welding current but auxiliary output is OK	1) Position of remote control switch 2) Potentiometer defect in welding current control 3) Welding current signal interrupter 4) Defect card 5) Defect in diode bridge	1) Check that it is in OFF position if there is no remote control, on "ON" with remote control inserted. 2) Check the continuity of the welding potentiometer and relative connections. 3) Check that cables from shunt to card are in perfect state. 4) Replace card. 5) Check the diode or the controlled diodes.
<b>P2</b> Defect in welding, high and discontinued sparks	1) Defect in connections between shunt and potentiometer 2) Defect in diode bridge 3) Defect in card	1) Check the continuity and the state of different connections which go to the card from the shunt as well as from the potentiometer. 2) Check the diodes and controlled diodes. 3) Replace the card.
<b>P3</b> No welding output and no auxiliary power output	1) Short circuit in wiring 2) Defective condenser 3) Defective stator 4) Short circuited diode bridge	1) Check the wiring inside the welder for a short circuit between cables or to ground. 2) If the wiring is OK, short circuit the condenser to be sure that it is discharged, disconnect all wires from condenser and, using an ohmmeter, check that the condenser is not short circuited. 3) If the condenser box is OK, disconnect all leads from the stator except for those going to the condenser box and check the output from the alternator. If there is no output from the welding winding and the auxiliary winding, replace the stator. 4) If there is output from all windings reconnect the diode bridge and check if there is welding current. If not the diode bridge is defective. If there is welding current connect the auxiliary power leads one at a time until there is no output; at this point, the short circuit is in that line.
<b>GENERATION</b>		
<b>P1</b> Warning light "POWER ON" off, but regular voltage at the sockets	1) Warning light defect	1) Replace warning light
<b>P2</b> Three-phase voltage not present at the socket but present on other sockets	1) Differential switch not inserted 2) Differential switch malfunction	1) Turn on the switch. 2) Replace the switch.
<b>P3</b> No single phase voltage one socket but reading is normal on the other sockets.	1) Intervention of thermal switch due to excessive current. 2) Thermal switch malfunction.	1) Push in the thermal switch. 2) Replace the thermal switch
<b>P4</b> No voltage present	1) Short circuit present on the generator outputs.	1) Disconnect all outputs on the generator except for those on the condensers and re-start machine; check for voltage on condensers.
<b>ENGINE</b>		
<b>P1</b> The engine does not start or stops immediately after startup.	1) Low battery voltage, battery dead or defective. 2) Presence of air in the fuel supply circuit.	1) Check the warning light "battery condition"- Green colour: battery OK - Black colour: battery to be recharged - White colour: battery to be replaced. <b>DO NOT OPEN THE BATTERY.</b> 2) Carry out de-aeration on the fuel system. See engine operating manual.
<b>P2</b> The battery does not charge. Battery charge warning light (N1) lit	1) Faulty battery charger 2) Battery charger alternator defective.	1) Check the battery charger/regulator, replace if faulty 2) Replace
<b>P3</b> For other problems, refer to the attached engine manual		

**WARNING**



**MOVING PARTS can injure**

- Have **qualified** personnel do maintenance and troubleshooting work.
- Stop the engine before doing any work inside the machine. If for any reason the machine must be operated while working inside, **pay attention** moving parts, hot parts (exhaust manifold and muffler, etc.) electrical parts which may be unprotected when the machine is open.
  - Remove guards only when necessary to perform maintenance, and replace them when the maintenance requiring their removal is complete.
  - Use suitable tools and clothes.
  - Do not modify the components if not authorized.  
- See pag. M1.1 -



**HOT surface can hurt you**

**NOTE**

By maintenance at care of the utilizer we intend all the operatios concerning the verification of mechanical parts, electrical parts and of the fluids subject to use or consumption during the normal operation of the machine.

For what concerns the fluids we must consider as maintenance even the periodical change and or the refills eventually necessary.

Maintenance operations also include machine cleaning operations when carried out on a periodic basis outside of the normal work cycle.

The repairs **cannot be considered** among the maintenance activities, i.e. the replacement of parts subject to occasional damages and the replacement of electric and mechanic components consumed in normal use, by the Assistance Authorized Center as well as by MOSA.

The replacement of tires (for machines equipped with trolleys) must be considered as repair since it is not delivered as standard equipment any lifting system.

The periodic maintenance should be performed according to the schedule shown in the engine manual. An optional hour counter (M) is available to simplify the determination of the working hours.

maintenance intervals and specific checks for each model: it is necessary to consult the specific engine or alternator USER AND MAINTENANCE manual.

**VENTILATION**

Make certain there are no obstructions (rags, leaves or other) in the air inlet and outlet openings on the machine, alternator and motor.

**ELECTRICAL PANELS**

Check condition of cables and connections daily. Clean periodically using a vacuum cleaner, **DO NOT USE COMPRESSED AIR.**

**DECALS AND LABELS**

All warning and decals should be checked once a year and **replaced** if missing or unreadable.

**STRENUOUS OPERATING CONDITIONS**

Under extreme operating conditions (frequent stops and starts, dusty environment, cold weather, extended periods of no load operation, fuel with over 0.5% sulphur content) do maintenance more frequently.

**BATTERY WITHOUT MAINTENANCE DO NOT OPEN THE BATTERY**

The battery is charged automatically from the battery charger circuit supplied with the engine.

Check the state of the battery from the colour of the warning light which is in the upper part.

- Green colour: battery OK
- Black colour: battery to be recharged
- White colour: battery to be replaced

**IMPORTANT**



In the maintenance operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/ or dispositions in force in the place.

**ENGINE and ALTERNATOR**

**PLEASE REFER TO THE SPECIFIC MANUALS PROVIDED.**

Every engine and alternator manufacturer has



**NOTE**

THE ENGINE PROTECTION NOT WORK WHEN THE OIL IS OF LOW QUALITY BECAUSE NOT CHARGED REGULARLY AT INTERVALS AS PRESCRIBED IN THE OWNER'S ENGINE MANUAL.



In case the machine should not be used for more than 30 days, make sure that the room in which it is stored presents a suitable shelter from heat sources, weather changes or anything which can cause rust, corrosion or damages to the machine.

☞ Have **qualified** personnel prepare the machine for storage.

### GASOLINE ENGINE

Start the engine: It will run until it stops due to the lack of fuel.

Drain the oil from the engine sump and fill it with new oil (see page M25).

Pour about 10 cc of oil into the spark plug hole and screw the spark plug, after having rotated the crankshaft several times.

Rotate the crankshaft slowly until you feel a certain compression, then leave it.

In case the battery, for the electric start, is assembled, disconnect it.

Clean the covers and all the other parts of the machine carefully.

Protect the machine with a plastic hood and store it in a dry place.

### DIESEL ENGINE

For short periods of time it is advisable, about every 10 days, to make the machine work with load for 15-30 minutes, for a correct distribution of the lubricant, to recharge the battery and to prevent any possible blocking of the injection system.

For long periods of inactivity, turn to the after sales service of the engine manufacturer.

Clean the covers and all the other parts of the machine carefully.

Protect the machine with a plastic hood and store it in a dry place.

In case of necessity for first aid and of fire prevention, see page. M2.5.



## IMPORTANT



In the storage operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/or dispositions in force in the place.

☞ Have **qualified** personnel disassemble the machine and dispose of the parts, including the oil, fuel, etc., in a correct manner when it is to be taken out of service.

In case of necessity for first aid and fire prevention, see page M2.5.

As cust off we intend all operations to be made, at utilizer's care, at the end of the use of the machine. This comprises the dismantling of the machine, the subdivision of the several components for a further reutilization or for getting rid of them, the eventual packing and transportation of the eliminated parts up to their delivery to the store, or to the bureau encharged to the cust off or to the storage office, etc.

The several operations concerning the cust off, involve the manipulation of fluids potentially dangerous such as: lubricating oil and battery electrolyte.

The dismantling of metallic parts liable to cause injuries or wounds, must be made wearing heavy gloves and using suitable tools.

The getting rid of the various components of the machine must be made accordingly to rules in force of law a/o local rules.

**Particular attention must be paid when getting rid of:**

**lubricating oils, battery electrolyte, and inflammable liquids such as fuel, cooling liquid.**

The machine user is responsible for the observance of the norms concerning the environment conditions with regard to the elimination of the machine being cust off and of all its components.

In case the machine should be cust off without any previous disassembly it is however compulsory to remove:

- tank fuel
- engine lubricating oil
- cooling liquid from the engine
- battery

**NOTE:** BCS is involved with custing off the machine **only** for the second hand ones, when not reparable. This, of course, after authorization.

## IMPORTANT

In the cust-off operations avoid that polluting substances, liquids, exhausted oils, etc. bring damage to people or things or can cause negative effects to surroundings, health or safety respecting completely the laws and/or dispositions in force in the place.

The information here below are to be intended only as indicative since the above norm is much larger. For further details please see the specific norms and/or the manufacturers of the product to be used in the welding process.

#### RUTILE ELECTRODES: E 6013

Easily removable fluid slag, suitable for welding in all position. Rutile electrodes weld in d.c. with both polarities (electrode holder at + or -) and in a.c.. Suitable for soft steels R-38/45 kg/mm<sup>2</sup>. Also for soft steels of lower quality.

#### BASIC ELECTRODES: E 7015

Basic electrodes weld only in d.c. with inverse polarity (+ on the electrode holder) ; there are also types for a.c. Suitable for impure carbon steels. Weld in all position.

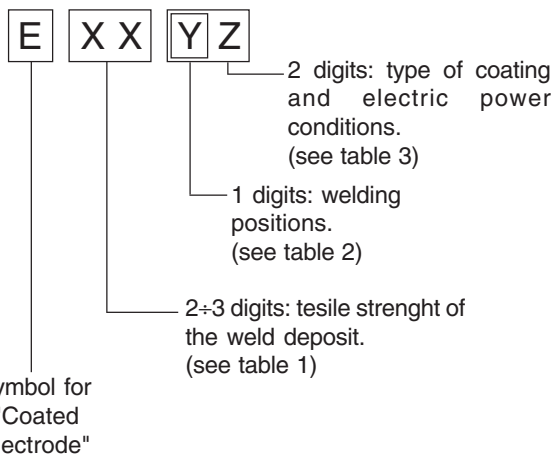
#### HIGH YIELD BASIC ELECTRODES: E 7018

The iron contained in the coating increases the quality of metal added. Good mechanical properties. Weld in all position. Electrode holder at + (inverse polarity). Weld deposit of nice aspect, also vertical. Workable; high yield. Suitable for steels with high contents of sulphur (impurities).

#### CELLULOSIC ELECTRODES: E 6010

Cellulosic electrodes weld only in d.c. with polarity + electrode holder - ground clamp. Special for steels run on pipes with R max 55 kg/mm<sup>2</sup>. Weld in all position. volatile slag.

## ELECTRODES IDENTIFICATION ACCORDING TO A.W.S. STANDARDS



Number	Strength	
	K.s.l.	Kg/mm <sup>2</sup>
60	60.000	42
70	70.000	49
80	80.000	56
90	90.000	63
100	100.000	70
110	110.000	77
120	120.000	84

Table 1

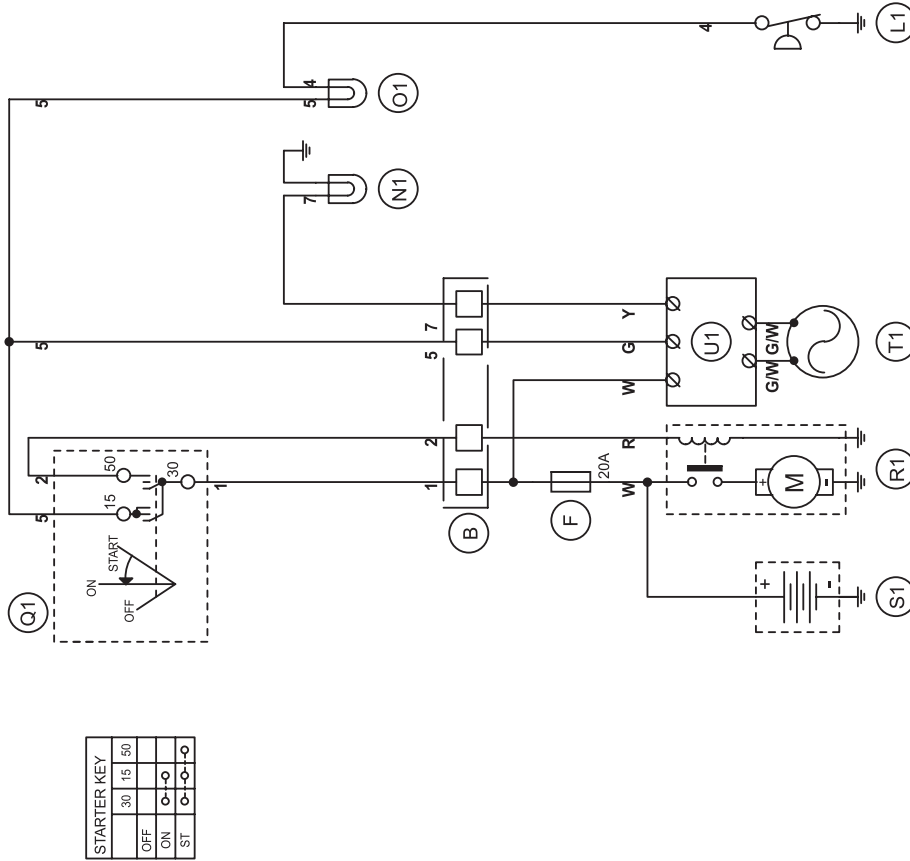
1	for all positions
2	for plane and vertical
3	for plane position only

Table 2

N°	Descrizione
10	Cellulose electrodes for d.c.
11	Cellulose electrodes for a.c.
12	Rutile electrode for d.c.
13	Rutile electrode for a.c.
14	High yield rutile electrodes
15	Basic electrodes for d.c.
16	Basic electrodes for a.c.
18	High yield basic electrodes for d.c. (inverse polarity)
20	Acid electrodes for flat or front position welding for d.c. (- pole) and for a.c.
24	High yield rutile electrodes for flat or front plane position welding for d.c. and a.c.
27	High yield acid electrodes for flat or front plane position welding for d.c. (- pole) and a.c..
28	High yield basic electrodes for flat or front plane position welding for d.c. (inverse polarity)
30	Extra high yield acid electrodes, extra high penetration if required, for flat position welding only for d.c. (- pole) and a.c.

Table 3

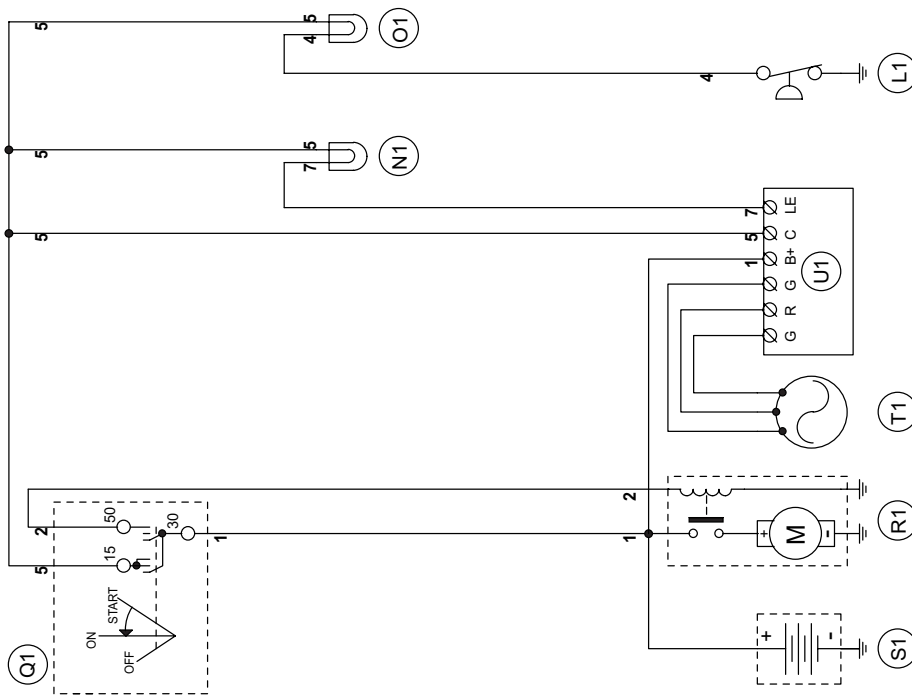
A	: Alternator	F3	: Stop push-button	L6	: Choke button
B	: Wire connection unit	G3	: Ignition coil	M6	: Switch CC/CV
C	: Capacitor	H3	: Spark plug	N6	: Connector – wire feeder
D	: G.F.I.	I3	: Range switch	O6	: 420V/110V 3-phase transformer
E	: Welding PCB transformer	L3	: Oil shut-down button	P6	: Switch IDLE/RUN
F	: Fuse	M3	: Battery charge diode	Q6	: Hz/V/A analogic instrument
G	: 400V 3-phase socket	N3	: Relay	R6	: EMC filter
H	: 230V 1phase socket	O3	: Resistor	S6	: Wire feeder supply switch
I	: 110V 1-phase socket	P3	: Sparkler reactor	T6	: Wire feeder socket
L	: Socket warning light	Q3	: Output power unit	U6	: DSP chopper PCB
M	: Hour-counter	R3	: Electric siren	V6	: Power chopper supply PCB
N	: Voltmeter	S3	: E.P.4 engine protection	Z6	: Switch and leds PCB
P	: Welding arc regulator	T3	: Engine control PCB	W6	: Hall sensor
Q	: 230V 3-phase socket	U3	: R.P.M. electronic regulator	X6	: Water heather indicator
R	: Welding control PCB	V3	: PTO HI control PCB	Y6	: Battery charge indicator
S	: Welding current ammeter	Z3	: PTO HI 20 l/min push-button	A7	: Transfer pump selector AUT-0-MAN
T	: Welding current regulator	W3	: PTO HI 30 l/min push-button	B7	: Fuel transfer pump
U	: Current transformer	X3	: PTO HI reset push-button	C7	: "GECO" generating set test
V	: Welding voltage voltmeter	Y3	: PTO HI 20 l/min indicator	D7	: Flooting with level switches
Z	: Welding sockets	A4	: PTO HI 30 l/min indicator	E7	: Voltmeter regulator
X	: Shunt	B4	: PTO HI reset indicator	F7	: WELD/AUX switch
W	: D.C. inductor	C4	: PTO HI 20 l/min solenoid valve	G7	: Reactor, 3-phase
Y	: Welding diode bridge	D4	: PTO HI 30 l/ min solenoid valve	H7	: Switch disconnecter
A1	: Arc striking resistor	E4	: Hydraulic oil pressure switch	I7	: Solenoid stop timer
B1	: Arc striking circuit	F4	: Hydraulic oil level gauge	L7	: "VODIA" connector
C1	: 110V D.C./48V D.C. diode bridge	G4	: Preheating glow plugs	M7	: "F" EDC4 connector
D1	: E.P.1 engine protection	H4	: Preheating gearbox	N7	: OFF-ON-DIAGN. selector
E1	: Engine stop solenoid	I4	: Preheating indicator	O7	: DIAGNOSTIC push-button
F1	: Acceleration solenoid	L4	: R.C. filter	P7	: DIAGNOSTIC indicator
G1	: Fuel level transmitter	M4	: Heater with thermostat	Q7	: Welding selector mode
H1	: Oil or water thermostat	N4	: Choke solenoid	R7	: VRD load
I1	: 48V D.C. socket	O4	: Step relay	S7	: 230V 1-phase plug
L1	: Oil pressure switch	P4	: Circuit breaker	T7	: V/Hz analogic instrument
M1	: Fuel warning light	Q4	: Battery charge sockets	U7	: Engine protection EP6
N1	: Battery charge warning light	R4	: Sensor, cooling liquid temperature	V7	: G.F.I. relay supply switch
O1	: Oil pressure warning light	S4	: Sensor, air filter clogging	Z7	: Radio remote control receiver
P1	: Fuse	T4	: Warning light, air filter clogging	W7	: Radio remote control transmitter
Q1	: Starter key	U4	: Polarity inverter remote control	X7	: Isometer test push-button
R1	: Starter motor	V4	: Polarity inverter switch	Y7	: Remote start socket
S1	: Battery	Z4	: Transformer 230/48V	A8	: Transfer fuel pump control
T1	: Battery charge alternator	W4	: Diode bridge, polarity change	B8	: Ammeter selector switch
U1	: Battery charge voltage regulator	X4	: Base current diode bridge	C8	: 400V/230V/115V commutator
V1	: Solenoid valve control PCBT	Y4	: PCB control unit, polarity inverter	D8	: 50/60 Hz switch
Z1	: Solenoid valve	A5	: Base current switch	E8	: Cold start advance with temp. switch
W1	: Remote control switch	B5	: Auxilliary push-button ON/OFF	F8	: START/STOP switch
X1	: Remote control and/or wire feeder socket	C5	: Accelerator electronic control	G8	: Polarity inverter two way switch
Y1	: Remote control plug	D5	: Actuator	H8	: Engine protection EP7
A2	: Remote control welding regulator	E5	: Pick-up	I8	: AUTOIDLE switch
B2	: E.P.2 engine protection	F5	: Warning light, high temperature	L8	: AUTOIDLE PCB
C2	: Fuel level gauge	G5	: Commutator auxiliary power	M8	: A4E2 ECM engine PCB
D2	: Ammeter	H5	: 24V diode bridge	N8	: Remote emergency stop connector
E2	: Frequency meter	I5	: Y/▲ commutator	O8	: V/A digital instruments and led VRD PCB
F2	: Battery charge transformer	L5	: Emergency stop button	P8	: Water in fuel
G2	: Battery charge PCB	M5	: Engine protection EP5	Q8	: Battery disconnect switch
H2	: Voltage selector switch	N5	: Pre-heat push-button	R8	: Inverter
I2	: 48V a.c. socket	O5	: Accelerator solenoid PCB	S8	: Overload led
L2	: Thermal relay	P5	: Oil pressure switch	T8	: Main IT/TN selector
M2	: Contactor	Q5	: Water temperature switch	U8	: NATO socket 12V
N2	: G.F.I. and circuit breaker	R5	: Water heater	V8	: Diesel pressure switch
O2	: 42V EEC socket	S5	: Engine connector 24 poles	Z8	: Remote control PCB
P2	: G.F.I. resistor	T5	: Electronic GFI relais	W8	: Pressure turbo protection
Q2	: T.E.P. engine protection	U5	: Release coil, circuit breaker	X8	: Water in fuel sender
R2	: Solenoid control PCBT	V5	: Oil pressure indicator	Y8	: EDC7-UC31 engine PCB
S2	: Oil level transmitter	Z5	: Water temperature indicator	A9	: Low water level sender
T2	: Engine stop push-button T.C.1	W5	: Battery voltmeter	B9	: Interface card
U2	: Engine start push-button T.C.1	X5	: Contactor, polarity change	C9	: Limit switch
V2	: 24V c.a. socket	Y5	: Commutator/switch, series/parallel	D9	: Starter timing card
Z2	: Thermal magnetic circuit breaker	A6	: Commutator/switch	E9	: Luquid pouring level float
W2	: S.C.R. protection unit	B6	: Key switch, on/off	F9	: Under voltage coil
X2	: Remote control socket	C6	: QEA control unit	G9	: Low water level warning light
Y2	: Remote control plug	D6	: Connector, PAC	H9	: Chopper driver PCB
A3	: Insulation moitoring	E6	: Frequency rpm regulator	I9	:
B3	: E.A.S. connector	F6	: Arc-Force selector	L9	:
C3	: E.A.S. PCB	G6	: Device starting motor		
D3	: Booster socket	H6	: Fuel electro pump 12V c.c.		
E3	: Open circuit voltage switch	I6	: Start Local/Remote selector		



STARTER KEY	
30	15 50
OFF	Ⓢ-Ⓢ
ON	Ⓢ-Ⓢ
ST	Ⓢ-Ⓢ

A		Modificato schema con nuovo motore completo di avvolg. carica batteria.		29.09.2006	N.L.
Ess. Exo.	Modifica Modification	Data Date	Dis. Desi.	Appr. Apoc.	
Dia. Fig. From Page		Denominazione: Engine Yanmar L100AE		Progetto: Project: 25676.prg	2 3
MOSA		Macchina: Machine: GE 6000 DES/GS		Dis. n.º: Dwg. n.º: 25646.S.010-A	Approvato: Approved: <i>[Signature]</i>
20090-CUSAGO (MI)-ITALY <a href="http://www.mosa.it">http://www.mosa.it</a>		Disegnatore: Designer: Leporace N.			

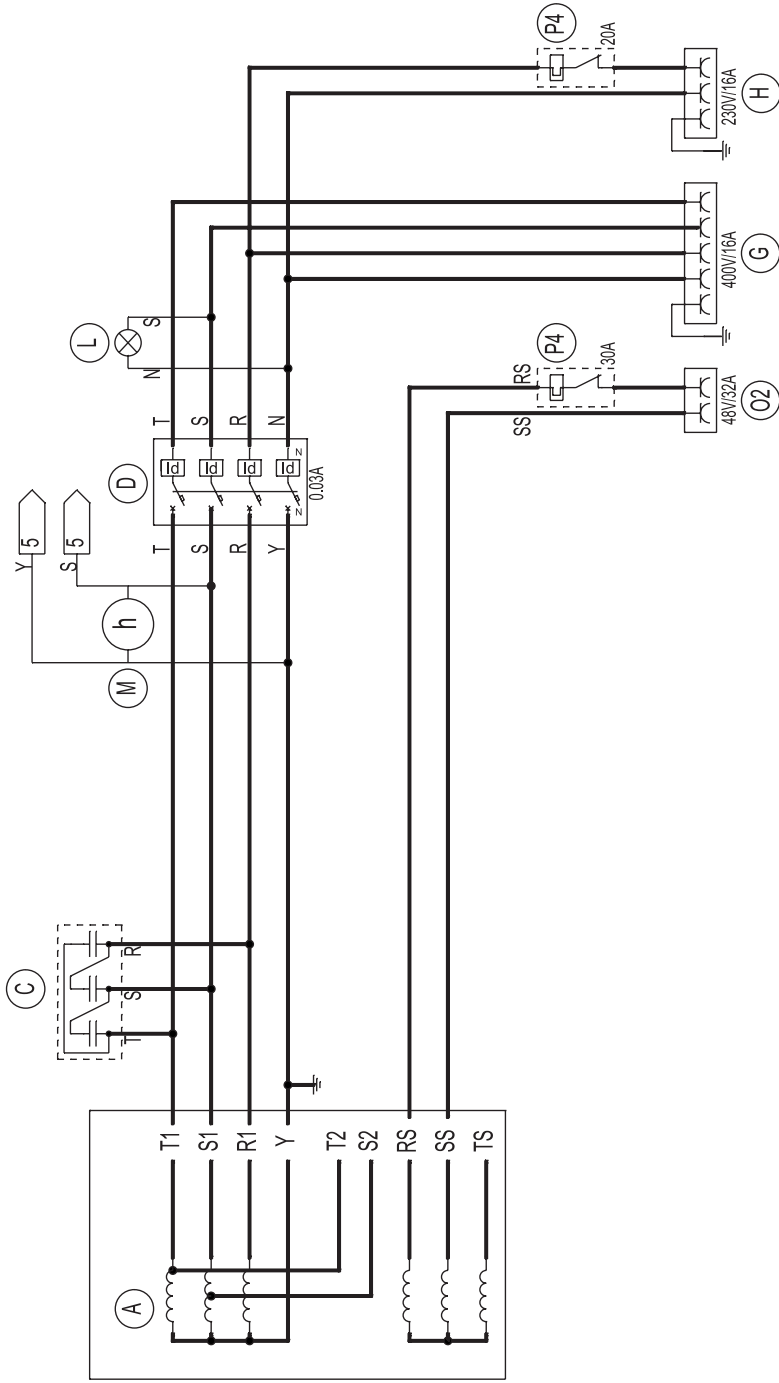
La MOSA si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.



STARTER KEY	
30	15
OFF	50
ON	—
ST	—

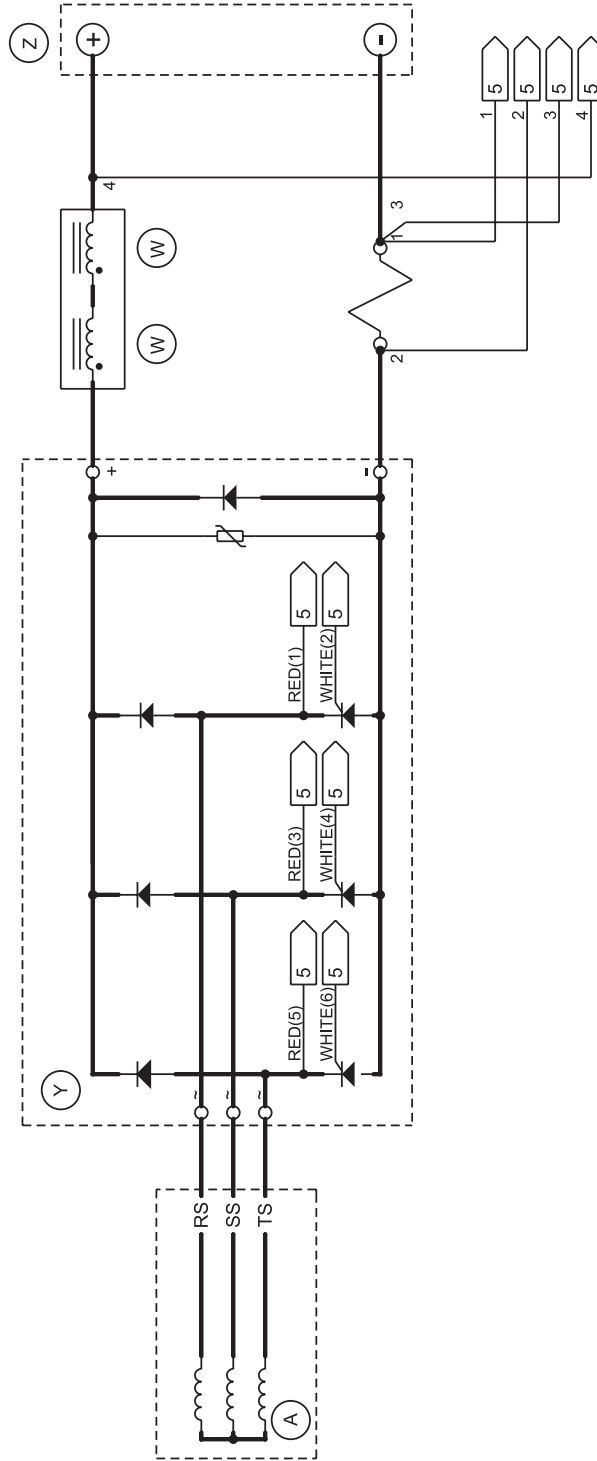
Esp. Exp.	Modifica Modification	Data Date	Dis. Desi.	Appr. Appr.
	Denominazione: Denomination:	Project: Project:	Page n° Page n°	of n° of n°
	Engine Lombardini 15 LD 440	25684.prg	2	3
	Macchina: Machine:	Disegnatore: Designer:	Approvato: Approver:	
	GE 7500 LDES/GS	Leporace N.	16.07.2007	
	20090-CUSAGO (MI)-ITALY	Dis. n° Dwg. n°:	25684.S.010	
	http://www.mosa.it			

La MOSA si riserva a termini di legge la proprietà dei presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.



A Sostituto alternatore (A) con nuovo avvolgimento senza carica batteria.		16.11.2006	N.L.
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			Dwg. n°:
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			Leporace N.
			Date:
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			Machine:
			TS 200 DES/EL
			http://www.mosa.it

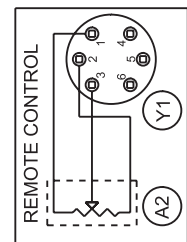
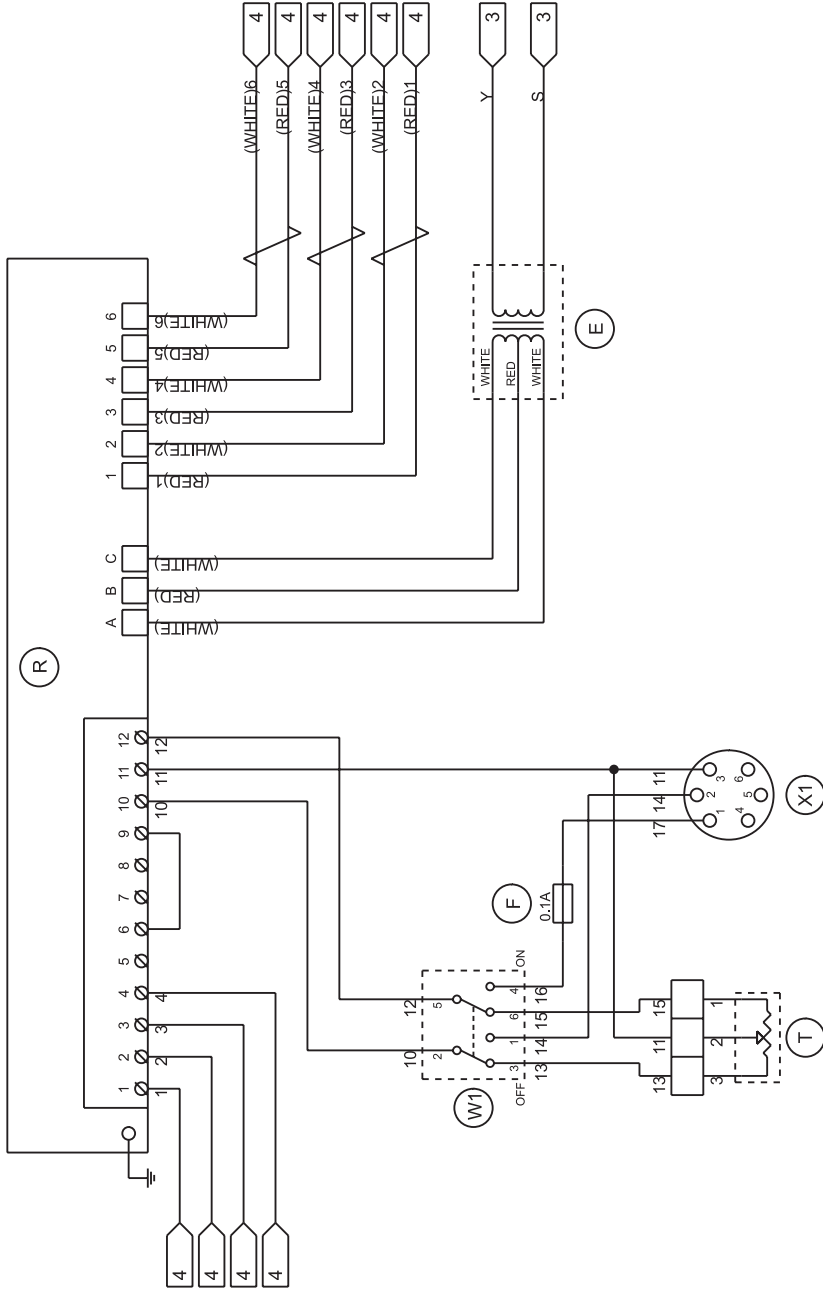
La MOSA si riserva a termini di legge la proprietà del presente disegno con divieto di riproduzione o comunicarlo a terzi senza sua autorizzazione.



Esp. Exp.	Modifica	Data	Dis. Desi.	Appr. Appr.
	Modification	Date	Project: 27292.prg	Page n° of n° 4 5
Da Pag. From Page	Denominazione: Denomination:	Dis. n° Dwg. n°	Disegnatore: Designer:	Approvato: Approver:
To Page	Welding Power	19.04.2005 27292.S.030	Leporace N.	
Alia Pag. To Page	Macchina: Machine:			
	TS 200 DES/EL			

La MOSA si riserva a termini di legge la proprietà del presente disegno con divieto di riproduzione o comunicato a terzi senza sua autorizzazione.





Esp. Exp.	Modifica Modification	Data Date	Dis. Dess.	Appr. Appr.
	Da Pag. From Page	Projecto: Project	Dis. n° of n°	Appr. n° of n°
	To Page	27292-prg	5	5
	Denominazione: Denomination:			
	Welding Control			
	Macchina: Machine:	Dis. n° of n°		Appr. n° of n°
	TS 200 DES/EL	27292.S.040		
	Disegnatore: Designer:	Data: Date:		
	Leporace N.	19.05.2005		

La MOSA si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.



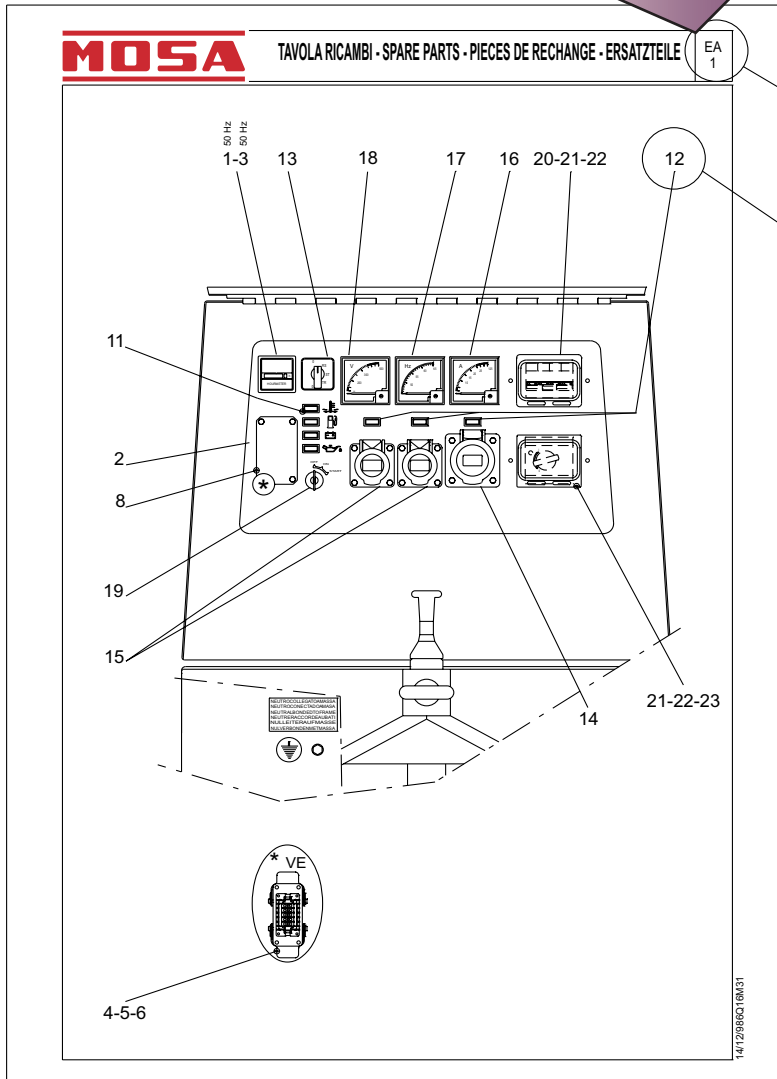
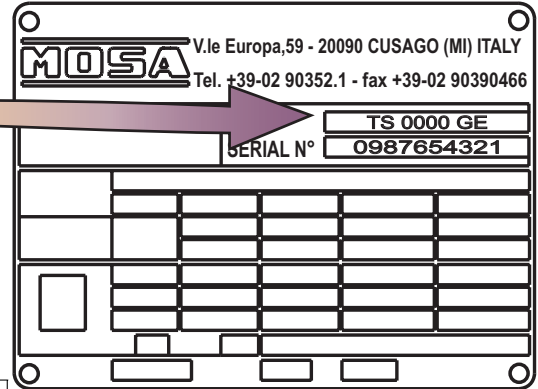
**MOSA guarantees that any request for spare parts will be satisfied.**

To keep the machine in full working order, when replacement of MOSA spare parts is required, always ask for genuine parts only.

👉 The requested data are to be found on the data plate located on the machine structure, quite visible and easy to consult. \*

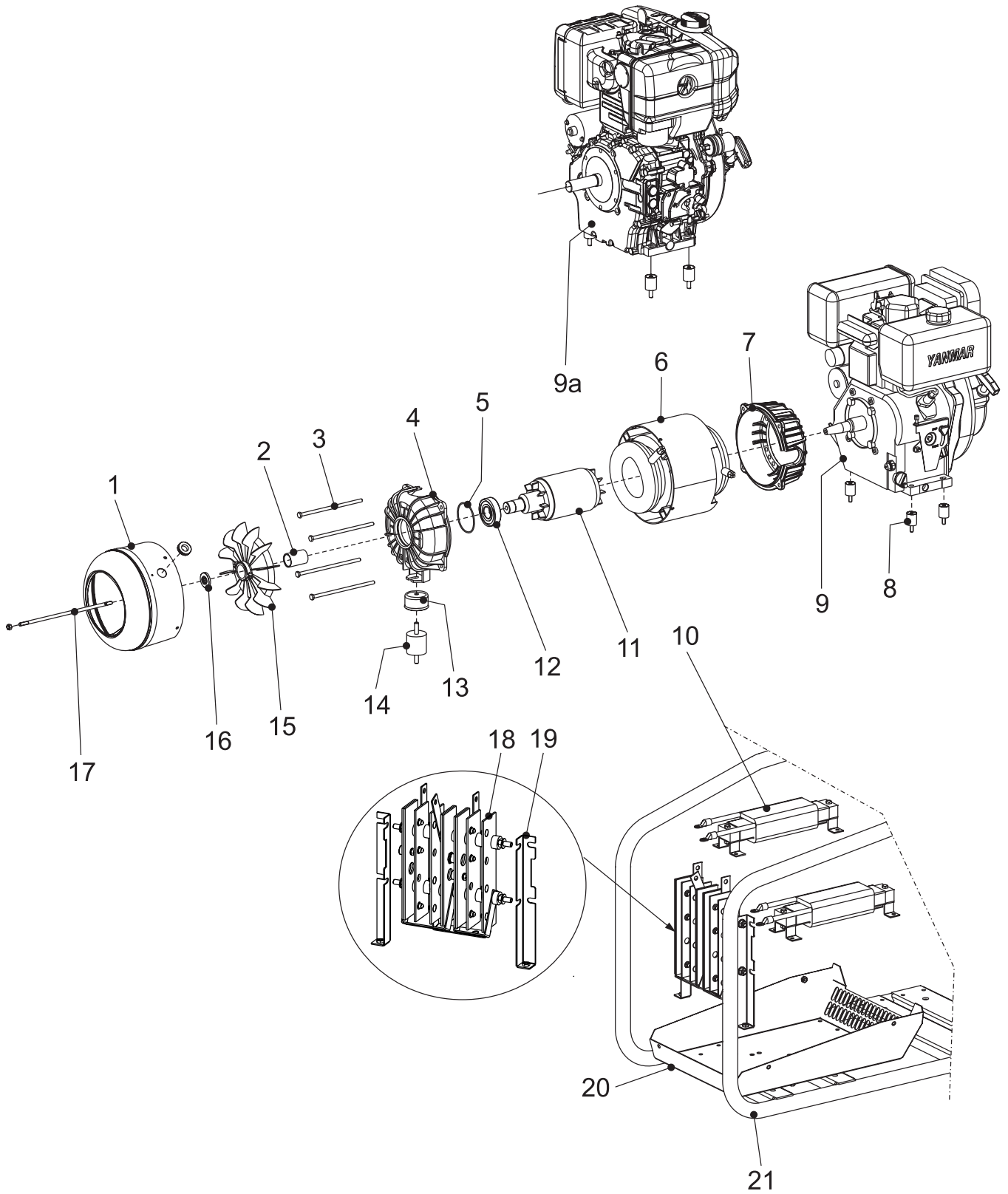
**When ordering the spare parts, it is recommended to indicate:**

- 1) \* serial number
- 2) \* model of welder and/or generating set
- 3) ◆ n. table
- 4) ◆ n. position
- 5) quantity

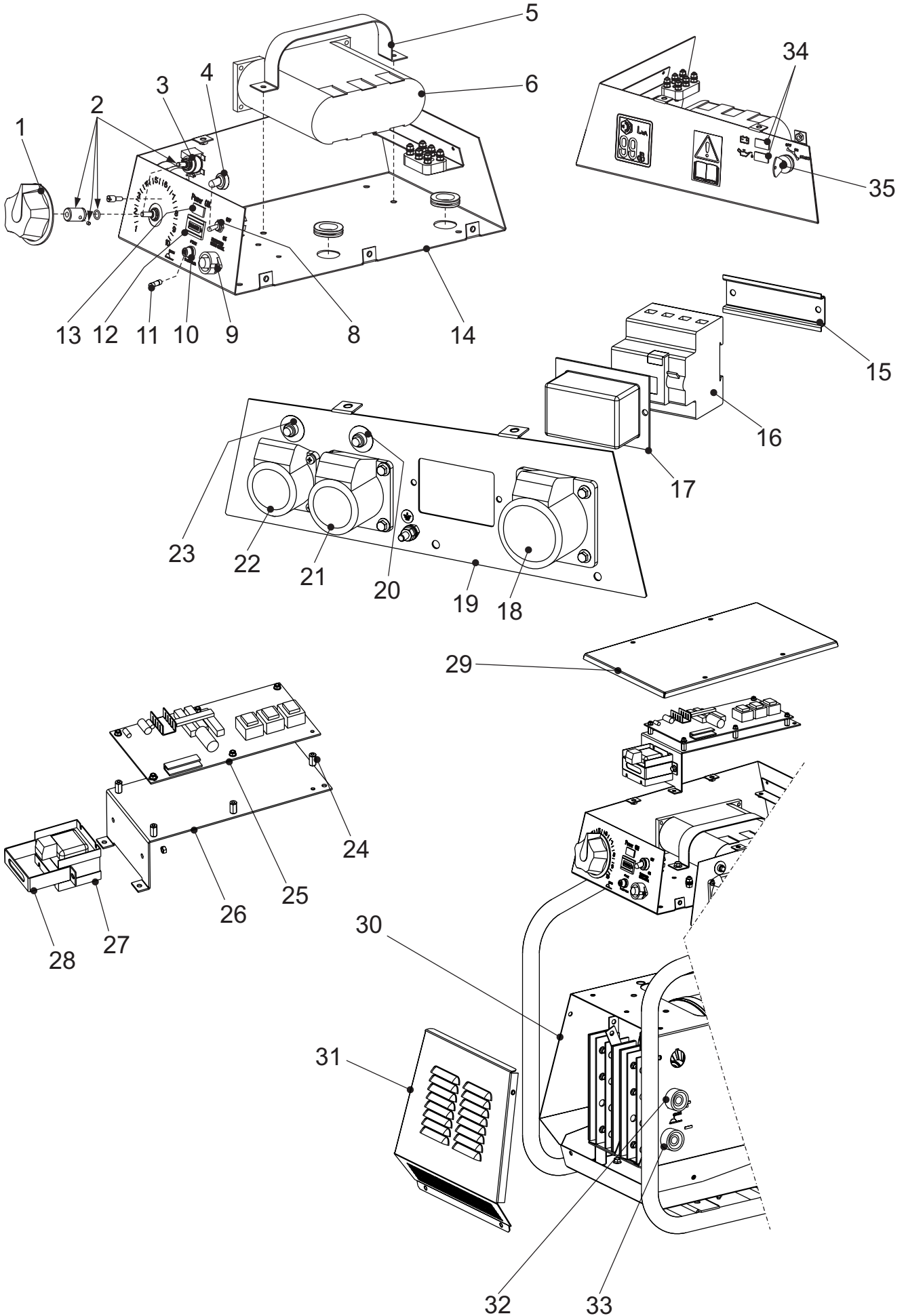


**ABBREVIATIONS AND SYMBOLS:**

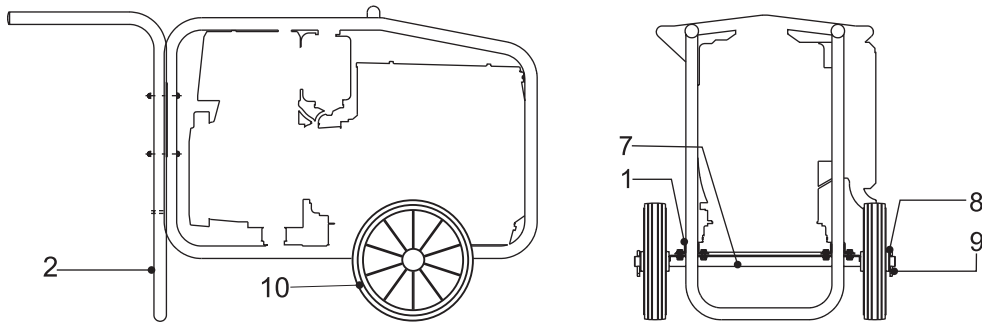
- (EV) When ordering, specify the engine type and the auxiliary voltage
- (ER) Engine with recoil starter only
- (ES) Engine with electric starter only
- (VE) E.A.S version only.
- (QM) When ordering, specify the length in meters
- (VS) Special version only
- (SR) By request only



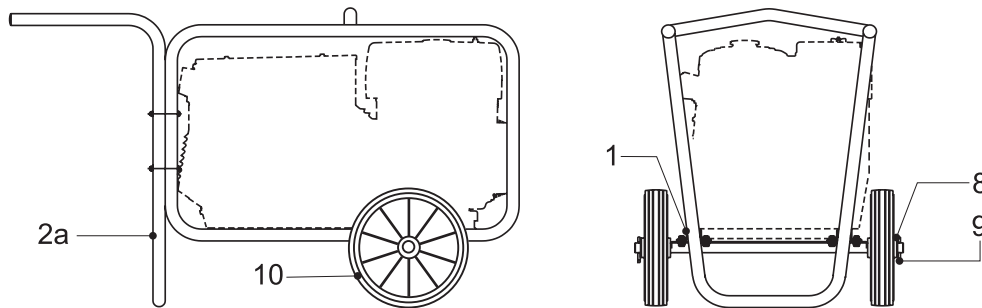
Pos.	Cod.	Descr.	Note
1	272506010	CONVOGLIATORE ARIA / AIR DUCT	
2	105311370	DISTANZIALE / SPACER	
3	107011280	TIRANTE / TIE - ROD	
4	105913045	FLANGIA PORTA ALTERNATORE / FLANGE, ALTERNATOR HOLDER	
5	1018100	ANELLO OR / OR RING	
6	372803025	STATORE / STATOR	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06
6	372853025	STATORE / STATOR	Dal/From REV.2-04/07 Del. 202/06 - 20/11/06
7	232123040	FLANGIA ATTACCO MOTORE / FLANGE FIXING ENGINE	
8	222401035	ANTIVIBRANTE / VIBRATION DAMPER	
9	272722200	MOTORE YANMAR L100AE-DEG / YANMAR ENGINE L100AE-DEG	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06
9	256862200	MOTORE YANMAR L100AE-DEG / YANMAR ENGINE L100AE-DEG	Dal/From REV.2-04/07 Del. 202/06 - 20/11/06
			Fino a/Up to REV.2-04/07 Del. 261/08 - 03/12/07
9	256762200	MOTORE YANMAR L100N / YANMAR ENGINE L100N	Dal/From REV.3-05/08 Del. 261/08 - 03/12/07
9a	256842200	MOTORE LOMBARDINI 15LD440 / LOMBARDINI ENGINE 15LD440	Dal/From REV.4-11/11 Del.107/11 - 27/10/11
10	208014100	REATTANZA DI LIVELLO / REACTOR	
11	232123030	ALBERO CON ROTORE / SHAFT WITH ROTOR	
12	1001030	CUSCINETTO / BEARING	
13	307012037	PROTEZIONE ANTIVIBRANTE / PROTECTION, VIBRATION-DAMPER	
14	105112020	ANTIVIBRANTE / VIBRATION DAMPER	
15	105111290	VENTOLA CON FASCETTA / FAN	
16	105311380	RONDELLA / WASHER	Fino a/Up to REV.0-10/98 Del. 91/06 - 07/06/06
16	356403038	RONDELLA / WASHER	Dal/From REV.1-11/06 Del. 91/06 - 07/06/06
17	232123036	TIRANTE / TIE - ROD	
18	208015100	GR. PONTE DIODI / DIODE BRIDGE ASSY	
19	208015041	STAFFA / BRACKET	
20	272708205	SCATOLA DI BASE / CASE, BOTTOM HALF	
21	272701050	BARELLA / PROTECTIVE FRAME	
22	155307107	DISGIUNTORE TERMICO 15A-250V / THERMAL SWITCH 15A-250V	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06
23	1302040	SPIA ROSSA 12V / RED WARNING LIGHT 12V	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06
24	256027060	PANNELLO / PANEL	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06
25	107302460	STARTER A CHIAVE / STARTER KEY	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06
26	256022275	REGOLATORE DI TENSIONE / VOLTAGE REGULATOR	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06
27	256027059	SCATOLA SUPPORTO REGOLATORE / BOX, SUPPORT REGULATOR	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06
28	256047102	STAFFA SUPP. FISS. SCATOLA / BRACKET	Fino a/Up to REV.1-11/06 Del. 202/06 - 20/11/06



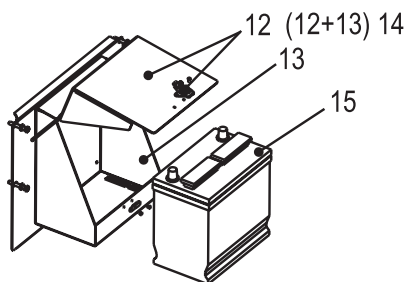
Pos.	Rev.	Cod.	Descr.	Note
1		107509702	MANOPOLA REG.CORRENTE SALDAT. / <i>KNOB, WELDING CURRENT REGULAT.</i>	
2		836709715	GR. POTENZIOMETRO / <i>WELDING CURRENT REGULATOR GR.</i>	
3		0000836709701	POTENZIOMETRO / <i>WELDING CURRENT REGULATOR</i>	
4		102042740	CAPPUCCIO / <i>CAP</i>	
5		307017037	STAFFA / <i>BRACKET</i>	
6		305159880	BOX CONDENSATORI / <i>CAPACITOR BOX 3X75</i>	
7		218017226	MORSETTIERA / <i>TERMINAL BOARD</i>	
8		102013290	COMMUTATORE / <i>COMMUTATOR</i>	
9		27292C042	CONNETTORE COMPL. DI CAVI / <i>CONNECTOR COMPL. WITH CABLES</i>	
10		307759045	PORTAFUSIBILE / <i>FUSE HOLDER</i>	
11		1291250	FUSIBILE / <i>FUSE</i>	
12		105511810	CONTAORE 230V 50Hz IP65 / <i>HOURMETER 230V 50Hz IP65</i>	
13		1302220	SPIA 230V / <i>WARNING LIGHT 230V</i>	Fino a REV.1-04/07 Del. 52/08 - 03/03/08
13		1302530	SPIA 230V / <i>WARNING LIGHT 230V</i>	Da REV.2-05/08 Del. 52/08 - 03/03/08
14		272927010	SCATOLA ELETTRICA / <i>ELECTRIC BOX</i>	
15		232027036	GUIDA / <i>FIXING GUIDE</i>	
16		105111540	Vedi Cod.219937105 / <i>See part no. 219937105</i>	
17		232027130	CAPPUCCIO PROTEZIONE I.D. / <i>CAP</i>	
18		305907270	PRESA CEE 16A 400V 3P+N+T / <i>EEC SOCKET 16A 400V 3P+N+T</i>	
19		272927020	PANNELLO FRONTALE / <i>FRONT PANEL</i>	
20		306467107	DISGIUNT. TERMICO 20AMP 250 V / <i>THERMOPROTECTION 20AMP 250 V</i>	
21		307017240	PRESA 220V 16A / <i>EEC SOCKET 16A, 220V 2P+T</i>	
22		218137280	PRESA CEE 48V 32A / <i>EEC SOCKET 48V 32A</i>	
23		873407107	DISGIUNTORE TERMICO 30A/250V / <i>CIRCUIT BREAKER 30A/250V</i>	
24		282009807	DISTANZ. ISOLANTE PER SCHEDE / <i>SPACER</i>	
25		208019800	SCHEDA DI CONTROLLO SALDATURA / <i>PCB, WELDING CONTROL</i>	
26		208019801	STAFFA / <i>BRACKET</i>	
27		107509870	TRASFORMATORE / <i>AUXILIARY TRANSFORMER</i>	
28		218019874	STAFFA BLOCC.TRASFORM.AUSIL. / <i>BRACKET</i>	
29		272707015	COPERCHIO SCATOLA ELETTRICA / <i>COVER ELECTRICAL BOX</i>	
30		272708005	CARENATURA / <i>FRAME</i>	
31		272708235	GRIGLIA DI ASPIRAZIONE / <i>INTAKE GRATE</i>	
32		102301310	PRESA DI SALDATURA (+) / <i>WELDING SOCKET (+)</i>	
33		102044400	PRESA DI SALDATURA (-) / <i>WELDING SOCKET (-)</i>	
34		1302040	SPIA ROSSA 12V / <i>RED WARNING LIGHT 12V</i>	Dal/From REV.1-04/07 Del. 202/06 - 20/11/06 Fino a REV.1-04/07 Del. 52/08 - 03/03/08
34		1302500	SPIA ROSSA 12V / <i>RED WARNING LIGHT 12V</i>	Da REV.2-05/08 Del. 52/08 - 03/03/08
35		107302460	STARTER A CHIAVE / <i>STARTER KEY</i>	Dal/From REV.1-04/07 Del. 202/06 - 20/11/06



Pos.	Rev.	Cod.	Descr.	Descr.	Note
1		107012150	CAVALLOTTO	U-BOLT	
2		107012130	MANIGLIA	HANDLE	
7		205311160	ASSALE	AXLE	
8		205311180	RONDELLA	WASHER	
9		6075020	COPIGLIA	PIN, SPLIT	
10		105311650	RUOTA	WHEEL	

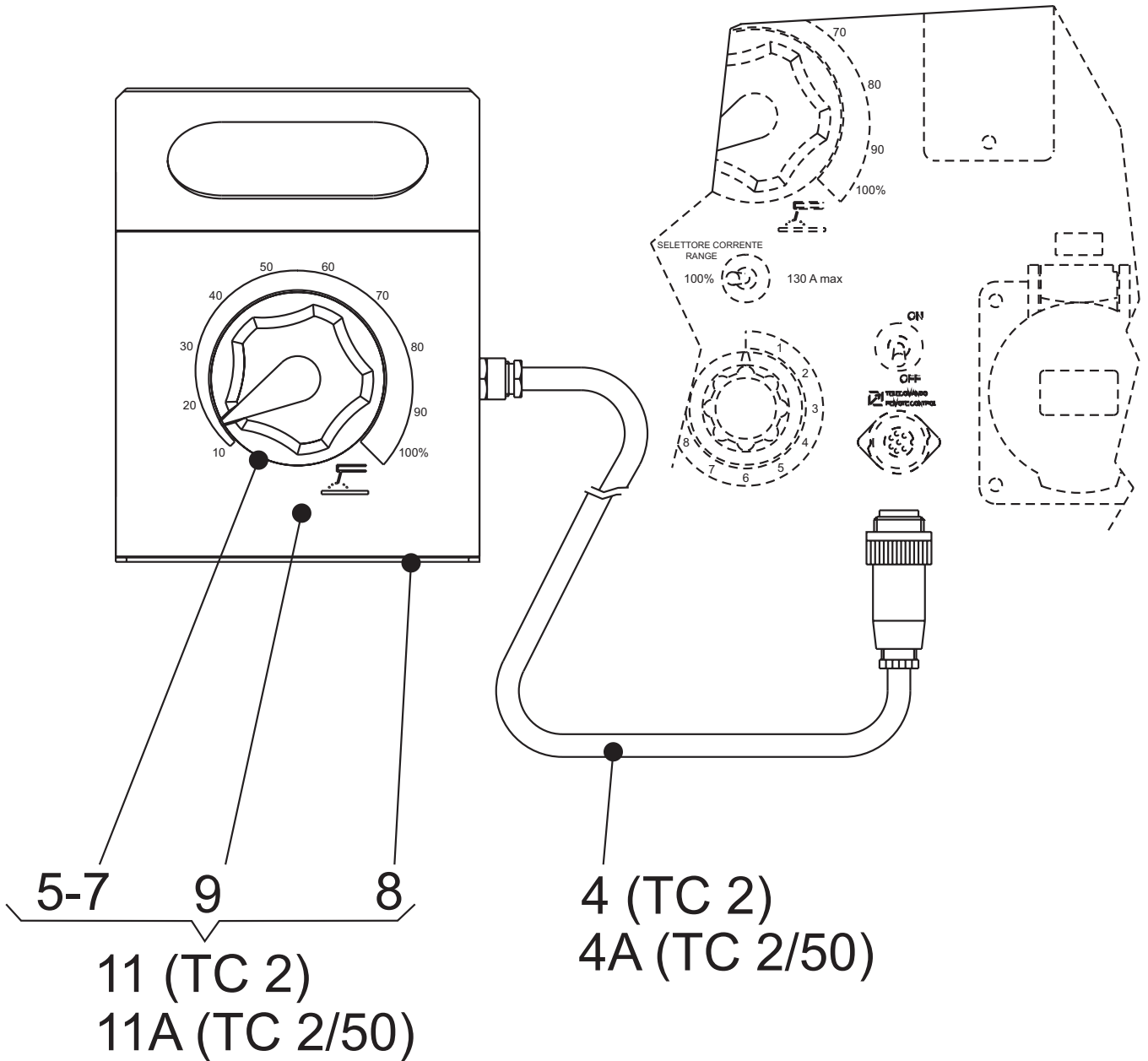


Pos.	Rev.	Cod.	Descr.	Descr.	Note
1		107012150	CAVALLOTTO	U-BOLT	
2a		208101051	MANIGLIA	HANDLE	
7		205311160	ASSALE	AXLE	
8		205311180	RONDELLA	WASHER	
9		6075020	COPIGLIA	PIN, SPLIT	
10		105311650	RUOTA	WHEEL	



Pos.	Cod.	Descr.	Descr.	Note
12	256020549	GR.COPERCHIO COMPLETO	COMPLETE COVER	
13	256029168	CESTELLO PORTABATTERIA	BATTERY HOLDER	
14	256029160	CESTELLO P/BATT.+COPERCHIO	BATTERY HOLDER WITH COVER	
15	209509150	BATTERIA	BATTERY	(fino a/up to REV.0 04/97 Del. 74/05 del 15/07/05)
15	372859150	BATTERIA	BATTERY	(da/from REV.1 10/05 Del. 74/05 del 15/07/05)





Pos. Cod.	Descr.	Note
4	209519904 CONNETTORE COMPLETO DI CAVI / CONNECTOR WITH CABLES	TC2 vers.
4a	930609904 CONNETTORE CON CAVI / CONNECTORS WITH CABLES	TC2/50 vers.
5	107509702 MANOPOLA REG. CORRENTE SALDAT. / KNOB, WELDING CURRENT REGULAT.	
7	107509700 POTENZIOMETRO / WELDING CURRENT REGULATOR	Fino a/ Up to REV. 10/99 - Del. 129/06 - 04/09/07
7	836709715 POTENZIOMETRO / WELDING CURRENT REGULATOR	Da/From REV. 07/07- Del. 129/06 - 04/09/07
8	107509900 SCATOLA / CASE, BOTTOM HALF	
9	209519901 COPERCHIO (CD) / COVER	
11	209510018 TC2 COMANDO DISTANZA STD / TC2 STD REMOTE CONTROL	
11a	930600018 TC2/50 COMANDO DISTANZA STD / TC2/50 STD REMOTE CONTROL	

